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**STATEMENT OF WORK FOR CONDUCTING A
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
AT THE ALBION-SHERIDAN TOWNSHIP LANDFILL SITE,
ALBION, MICHIGAN**

This document is the Statement of Work (SOW) for conducting a Remedial Investigation (RI) and Feasibility Study (FS) at the Albion-Sheridan Township Landfill ("Albion-Sheridan") NPL site located in Calhoun County, Michigan. The purpose of this SOW is to provide the direction and intent of the RI/FS. Within 60 days of the effective date of the Consent Order a RI/FS Work Plan shall be submitted based on this SOW that provides detailed guidance on the execution of the RI/FS.

The purpose of the RI is to investigate the site's physical characteristics, identify the sources of contamination, and determine the nature and extent of contamination at the Albion-Sheridan site. The purpose of the FS is to develop and evaluate remedial action alternatives based on the RI data and report. All personnel, materials, and services required to perform the RI/FS will be provided by the Potentially Responsible Parties (PRPs).

The tasks described herein are grouped into the following three categories:

- o Plans and Management,
- o Remedial Investigation (RI), and
- o Feasibility Study (FS).

The Work Plan developed pursuant to this SOW will present a phased approach that recognizes the interdependency of the RI and FS. The data collected in the RI influences the development of remedial alternatives in the FS, which in turn affects the data needs and scope of treatability studies and additional field investigations. The overall organization and interactive nature of this approach are illustrated in Figure 1.

The primary intent of the phased approach is to minimize the need for conducting post-FS or supplemental RI/FS activities by thorough characterization of the migration pathways and early identification of the site specific data requirements associated with the applicable remedial technology.

Brief discussions of the major RI/FS tasks are presented, by major topical categories, in the following sections.

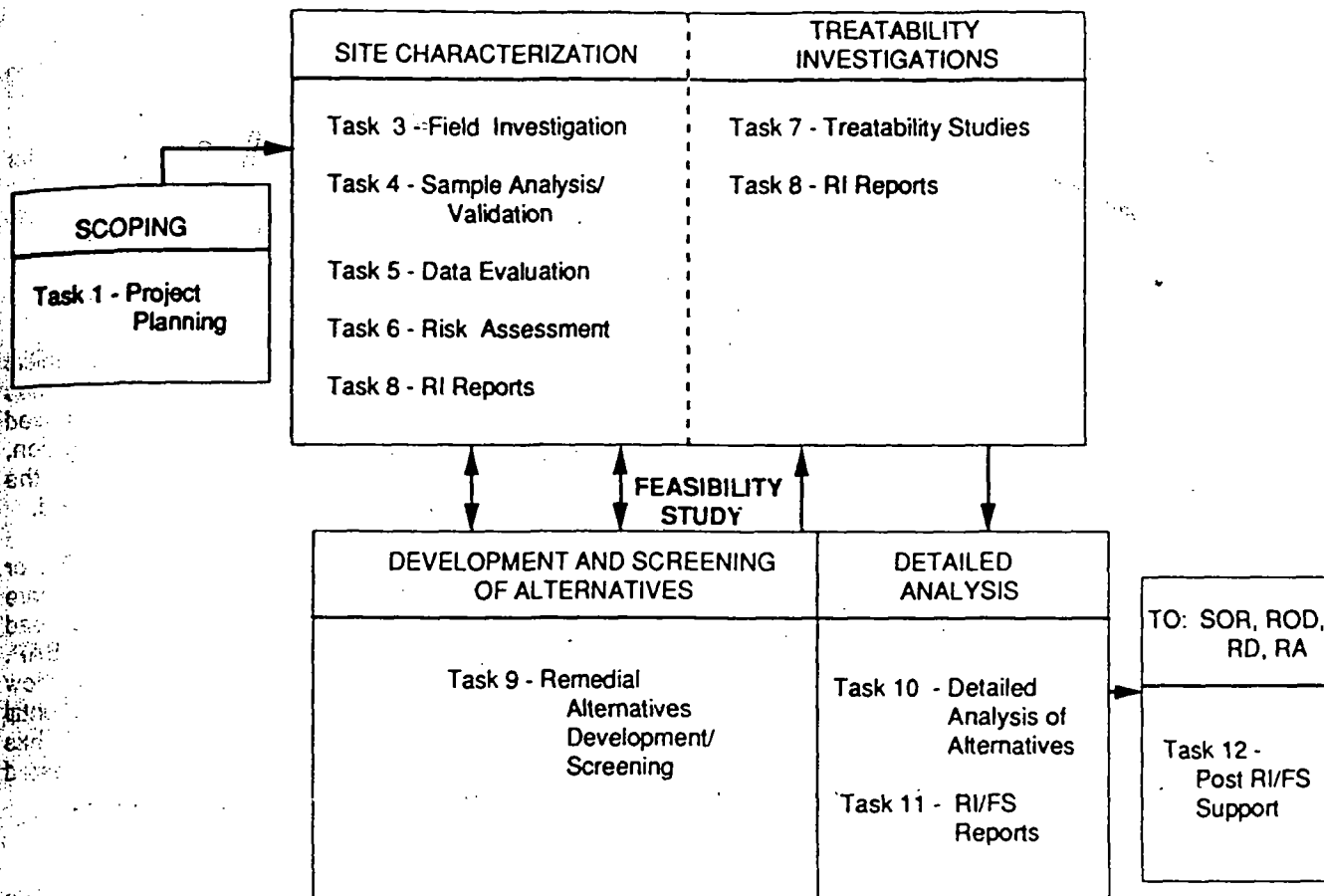
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FIGURE 1

REMEDIAL INVESTIGATION



RI/FS WORK PLAN STANDARD TASKS

TASK	TITLE
1	Project Planning
2	Community Relations *
3	Field Investigation
4	Sample Analysis/ Validation
5	Data Evaluation
6	Risk Assessment
7	Treatability Study/ Pilot Testing
8	Remedial Investigation Reports
9	Remedial Alterna- tives Development/ Screening
10	Detailed Analysis of Alternatives

- 11 Feasibility Study
(RI/FS) Reports
- 12 Post RI/FS Support
- 13 Enforcement Support *
- 14 Miscellaneous
Support *

* Tasks that can
occur in any Phase
of the RI/FS

Note: Tasks should be numbered and labelled as indicated
in this Statement of Work for the Albion-Sheridan Site.

Figure 2-4. Relationship of RI/FS Tasks to Phased RI/FS Approach.

I.

PLANS AND MANAGEMENT

TASK 1 - PROJECT PLANNING

A. INVESTIGATIVE SUPPORT AND DESCRIPTION OF CURRENT SITUATION

1. Information and Data Gathering

a. Site Mapping

The Respondents will prepare an accurate topographic map of appropriate working scale. A base map of the site with a scale of 1 inch to 100 feet (1" - 100') and 2-foot contour intervals will be prepared from this topographic map. The base map will illustrate the locations of wetland areas, floodplains, water features, drainage patterns, tanks, buildings, utilities, paved areas, easements, right-of-ways, known or suspected sites of environmental contamination that exist in the geographical area and other pertinent features. Larger scale maps will be produced from the base map as necessary.

In addition to the topographic map, a grid plan will be prepared using the base map and grid overlay. This grid plan will show sampling locations and the locations of water supply wells. Existing monitoring wells on-site will be located and indicated on the grid. These maps will require surveying to establish horizontal and vertical controls for sites of the work relative to the National Geodetic Vertical Datum of 1929.

The Respondents will review and verify in the field the legal description of the property. The intent is not to perform a boundary survey, but to locate the boundaries so that future activities do not carry over onto adjacent property without proper permission. Boundary markers will be set in place and maintained.

b. Metes and Bounds

The Respondents will assemble a legal description of the site from existing county and township records and results of the site survey.

c. Access Arrangements

The Respondents will make the necessary arrangements to guarantee access to the site and surrounding parcels. These arrangements will include negotiating access agreements with landowners and obtaining demarcation clearance for all buried utilities and construction of

access roads. "Miss Dig", a Michigan statewide network that locates utilities in or near areas of construction or excavation, will be notified so that they may have the opportunity to mark, in advance, the location of all utilities in the area of the site investigation.

d. Preparation of Support Facilities

The Respondents will initiate and implement the necessary arrangements to construct support facilities and/or procure the equipment necessary to performing a hazardous site investigation. This includes preparation of decontamination facilities, utility hook-ups, and site access control stations.

e. Description of Current Situation

The Respondents will gather and describe the background information pertinent to the site and its environmental concerns, further detailing the purpose of the RI. The data gathered during previous investigations will be reviewed and evaluated. Regional information will be obtained from available USGS and Michigan Geologic Survey reports. The existing site information to be reviewed will include but not necessarily be limited to:

- o Michigan Department of Natural Resources and Environmental Protection Agency files.
- o Calhoun County Soil Conservation Service reports.
- o Calhoun County Health Department files.
- o Aerial photographs.
- o Historical water quality data.
- o U.S. and Michigan Geological Survey files.
- o Disposal records (if available).

In addition to this literature search, on-site activities may be used to confirm and/or update certain information. For example, existing monitoring wells may be inspected to determine if they are functional and the location and status of selected water supply wells field verified.

2. Preliminary Site Evaluation

Information and data that are gathered during these initial steps will be used for a preliminary site evaluation that will

address the following:

- a. A complete history of waste disposal activities and ownership transfer on the site.
- b. A description of pertinent site features and boundary conditions, general site physiography, hydrology, and geology.
- c. A summary of known or potential on-site and off-site health and environmental effects based on existing information. Threats or potential threats to public health and the environment will be emphasized.
- c. The history of response actions that includes a summary of response actions conducted by local, state, or private parties.
- d. A definition of site boundary conditions to identify the areas of investigation. The boundaries will be set so that the on-site activities will cover the contaminated media in sufficient detail to support the FS. Boundaries for site access control and site security will also be identified. The boundaries of the study area may or may not correspond to the property boundaries.
- e. Identification of potential receptors, both human and environmental. For a potentially exposed population, information will be collected on population size and location. Census and other survey data may be used to identify and describe the population potentially exposed, in addition to information from USGS maps, land use plans, zoning maps and regional planning authorities. Also included will be the identification of private and public water supply wells within a two mile radius of the site. If possible, obtain the well construction details for these wells and other private water supply wells that may have been previously sampled and prepare a table summarizing the known construction details to submit with the original drilling logs.
- f. Development of a site conceptual model using information on the waste sources, pathways and receptors at the site. The conceptual site model will include all known and suspected sources of contamination, types of contaminants and affected media, known and potential routes of migrations, and known or potential human and environmental receptors. If data are unavailable for components of the model, the likely variability in the component will be identified so that the model identifies the possible range of contaminant migration and the

potential effects on receptors. The site conceptual model, in addition to assisting in identifying where samples need to be taken, will also assist in identifying appropriate remedial technologies. All subsequent site investigation activities will refine and validate this model.

The preliminary site evaluation will support and be included in the Work Plan.

B. RI/FS WORK PLAN PREPARATION

A RI/FS Work Plan will be prepared for the Albion-Sheridan site that details the technical approach, personnel requirements, and schedule for each task described in this SOW. The schedule will show the implementation of tasks and submission of deliverables. The timeframes will be consistent with the submittal schedule attached to this SOW.

The Work Plan shall be submitted in accordance with the schedule defined in Section VIII (Work to be Performed) of the Consent Order. Specifically, the RI/FS Work Plan shall be developed and implemented in conformance with all provisions of the Consent Order, this SOW, and the standards set forth in the following statutes, regulations, and guidance:

- o CERCLA, as amended by SARA, especially Section 121,
- o U.S. EPA "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA," Interim Final, dated October 1988,
- o The National Contingency Plan, 40 CFR Part 300, as amended,
- o U.S. EPA "CERCLA Compliance with Other Laws Manual," Parts I and II, August 1988 and 1989, and,
- o Any additional guidance documents provided by the U.S. EPA.

Incorporated into this Work Plan will be the following specific plans:

1. Field Sampling Plan

A Sampling Plan that addresses all data acquisition activities will be prepared. The plan will contain a statement of sampling objectives and equipment specifications, required analyses, sample types, and sample locations and frequency. The plans will address specific hydrologic, hydrogeologic, and air transport characterization methods including, but not

limited to, geologic mapping, geophysics, field screening, drilling and well installation, flow determination, and sampling.

In addition, the plan will identify the data requirements of specific remedial technologies that may be necessary to evaluate remedial alternatives in the FS. It will include an evaluation explaining what additional data are required to adequately characterize the site, evaluate the no-action alternative, and support the feasibility study. It will provide a schedule stating when events will take place and when deliverables will be ready.

2. Quality Assurance Project Plan

A Quality Assurance Project Plan (QAPP), prepared in accordance with current U.S. EPA guidance, will be appended to the Sampling Plan. The QAPP will describe the project and project personnel organization and responsibilities. It will include quality assurance objectives for data (precision, accuracy, completeness, representativeness, comparability, and intended use) and specify sampling procedures, locations, parameters, number of samples, and sample custody.

The QAPP will specify the type and frequency of calibration procedures for field and laboratory instruments; the analytical procedures used; the procedures for data reduction, validation and reporting; the type and frequency of internal quality control checks; the type and frequency of quality assurance performance audits and system audits; the preventive maintenance procedures and schedule; specific procedures to assess data precision, representativeness, comparability, accuracy, and completeness of specific measurement parameters, and corrective action procedures for field and laboratory instruments.

The QAPP will also describe how the data will be documented and tracked, including documentation materials and procedures, and financial reporting procedures. A pre-QAPP meeting will be held to review and discuss the details needed in the QAPP.

3. Health and Safety Plan

A Health and Safety Plan to protect the health of personnel involved in site activities and the surrounding community, will be developed on the basis of site conditions and be consistent with the following regulations and guidance:

- o 20 CFR 1910.120 (i) (2) - Occupational Health and Safety Administration: Hazardous Waste Operations and Emergency Response, Interim Rule, December 19, 1986.

- o U.S. EPA Order 1440.2 - Health and Safety Requirements for Employees Engaged in Field Activities.
- o U.S. EPA O 1440.3 - Respiratory Protection.
- o U.S. EPA Occupational Health and Safety Manual.
- o U.S. EPA Interim Standard Operating Procedures (September, 1982).

The health and safety plan will provide information on provisions to protect site visitors, personnel responsibilities, protective equipment, procedures, protocols, decontamination methods, and medical surveillance, routes and maps to local hospitals and phone numbers of emergency personnel.

4. Data Management Plan

A Data Management Plan will be developed to document and track investigative data and results. The plan will identify and establish laboratory and data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents.

5. ATSDR Health Assessment

The Work Plan for the site will also provide for collection of adequate information to support the ATSDR Health Assessment required by SARA. Since the health assessment will be prepared by ATSDR, all draft Work Plans and support documents will be submitted for ATSDR review and comment to ensure that their needs and requirements are being met. In the event that the health assessment has already been completed by ATSDR, the RI report will include and address the findings of that report.

6. Baseline Risk Assessment

The Baseline Risk Assessment, which will include an evaluation of the risks to human health and the risks to the environment, will be performed by U.S. EPA. The Work Plan will provide for collection of adequate information to support this assessment. The Baseline Risk Assessment will be conducted in accordance with U.S. EPA's "Interim Final Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual" (Part A) and U.S. EPA's "Interim Final Risk Assessment Guidance for Superfund, Volume II, Environmental Evaluation Manual," as well as the NCP, the RI/FS Guidance, and any other appropriate guidance and data bases.

II.

REMEDIAL INVESTIGATION

The objectives of the RI are to:

- o Characterize contamination present at the site;
- o Characterize the source(s) of potential contamination;
- o Characterize the hydrogeologic and physical setting, and evaluate the most likely contaminant migration pathways and physical features that could affect potential remedial actions;
- o Determine the migration rates, extent, and characteristics of any contamination that may be present at the site;
- o Gather data and information to the extent necessary and sufficient to quantify the risk to public health and the environment; and
- o Support the development and evaluation of viable remedial alternatives in the FS.

The scope of the Remedial investigation consists of six tasks:

- Task 2: Field Investigations
- Task 3: Sample Analysis/Validation
- Task 4: Data Evaluation
- Task 5: Bench/Pilot Testing Studies
- Task 6: Reports
- Task 7: Community Relations Support

Each of these tasks is described in the following sections.

TASK 2 - FIELD INVESTIGATIONS

Investigations necessary to characterize the site and its actual or potential hazard to public health and the environment will be conducted. The investigations will result in data of adequate technical content to support the development and evaluation of remedial alternatives during the FS. Investigation activities will focus on problem definition and data to support the screening of remedial technologies, alternative development and screening, and detailed evaluation of alternatives.

The field investigation activities will follow the Plans set forth in Task 1. All sample analyses will be conducted at laboratories following EPA protocols or their equivalents. Strict chain of custody procedures will be followed, and all samples will be located on the site map (and grid system) established under Task 1. A description of the types of investigations that will be conducted is presented below.

A. WASTE CHARACTERIZATION

Determine the location, type and quantities as well as the physical or chemical characteristics of any waste remaining at the site. If hazardous substances are held in containment vessels, the integrity of the containment structure and the characteristics of the contents will be determined.

B. HYDROGEOLOGIC INVESTIGATION

Evaluate the subsurface geology and characteristics of the water bearing formations, as well as determine the presence and potential extent of groundwater contamination. Efforts should begin with a survey of previous hydrogeologic studies and other existing data. The survey should address the soil's retention capacity/mechanisms, discharge/recharge areas, regional flow directions and quality, and the likely effects of any alternatives that are developed involving the pumping and disruption of groundwater flow. Results from the sampling program should estimate the horizontal and vertical distribution of contaminants, the contaminants' mobility and predict the long-term disposition of contaminants.

C. SOILS AND SEDIMENTS INVESTIGATION

Determine the vertical and horizontal extent of contamination of surface and subsurface soils and sediments and identify any uncertainties with this analysis. Information on local background levels, degree of hazard, location of samples, techniques used, and methods of analysis should be included. If initial efforts indicate that buried waste may be present, the probable locations and quantities of these subsurface wastes should be identified through the use of appropriate geophysical methods.

Characteristics of the existing landfill cover should also be defined.

D. SURFACE WATER INVESTIGATION

Estimate the extent and fate of any contamination in the nearby surface waters. This effort will include an evaluation of the point of discharge to these surface waters, possible future discharges and the degree of contaminant dilution expected. Drainage patterns and runoff characteristics will also be evaluated for potential erosional transport, and any floodplains will be defined.

E. AIR INVESTIGATION

Investigate the extent of atmospheric contamination from those contaminants found to be present at the site. This effort should assess the potential of the contaminants to enter the atmosphere, local wind patterns, and the anticipated fate of airborne contaminants.

F. ECOLOGICAL INVESTIGATION

Biological and ecological information will be collected for use in the Baseline Risk Assessment. The information will include a general identification of flora and fauna in and around the site (including endangered and threatened species and those consumed by humans or found in human food chains) and identification of critical habitats. It is anticipated that this information will be derived from a combination of existing information and data resulting from the field investigations.

Provisions will be made for conducting additional site investigation activities as necessary. These supplemental investigations are intended to further characterize the sources, pathways, and/or contaminants and to satisfy the specific data requirements of the Baseline Risk Assessment and the applicable remedial actions. The Work Plan and supplemental plans (QAPP, FSP, etc.) will be modified and revised during the RI/FS process to incorporate new information and refined project objectives.

TASK 3 - SAMPLE ANALYSIS/VALIDATION

An analysis of all data collected during this investigation will be made to assure that the quality (e.g., QA/QC procedures have been followed) and quantity of data adequately support the Baseline Risk Assessment and FS. Collected data should be validated at the appropriate field or laboratory QC level to determine whether it is appropriate for its intended use.

TASK 4 - DATA EVALUATION

All site investigation data will be evaluated and presented in an organized and logical manner so that the relationships between site investigation results for each medium are apparent. A summary will be prepared that describes (1) the quantities and concentrations of specific chemicals at the site and the ambient levels surrounding the site; (2) the number, locations, and types of nearby populations and activities; and (3) the potential transport mechanism and the expected fate of the contaminant in the environment. This summary will be submitted to U.S. EPA for use in the Baseline Risk Assessment.

TASK 5 - BENCH/PILOT STUDIES

Bench and pilot scale studies will be performed as necessary to determine the applicability of selected remedial technologies to site specific conditions. These may include treatability and cover studies, aquifer testing, and/or material compatibility testing. As shown on Figure 1, these studies will be conducted in the later stages of the RI after the initial screening of remedial technologies and actions.

TASK 6 - REPORTS

A. PROGRESS REPORTS

Monthly progress reports will be prepared to describe the technical progress of the RI/FS. These reports will be submitted to the U.S. EPA by the tenth business day of each month, following the commencement of the work detailed in the RI/FS Work Plan. The monthly progress reports will include the following information:

- o All sampling and testing results and all other raw data produced during the month pursuant to the implementation of the Consent Order;
- o Copies of all daily field notes taken during the reporting period;
- o A description of activities completed during the past month pursuant to the Consent Order, as well as such actions and plans that are scheduled for the next month pursuant to the Consent Order;
- o A description of difficulties encountered during the reporting period and the actions taken to rectify the problems;
- o Target and actual completion dates for each element of activity, including the project completion; percentage of work completed, and an explanation of any deviation from the schedules provided in the RI/FS Work Plan;

- o Changes in key personnel which have occurred during the reporting period; and
- o Summaries of conferences calls and meetings held during the reporting period between the PRPs and U.S. EPA and/or MDNR, in order to ensure that mutual agreement and understanding has been reached on all issues discussed concerning the project.

B. TECHNICAL MEMORANDA

The results of specific remedial investigation activities will be submitted in draft form to the U.S. EPA and the MDNR throughout the RI process. The specific technical memoranda and their associated schedule of submittal will be identified in the project Work Plan (Task 1). All responses to U.S. EPA and the MDNR comments concerning memorandum issues will be addressed in letters from the Respondent Project Coordinator to the U.S. EPA Remedial Project Manager and will be incorporated in the draft RI report.

C. REMEDIAL INVESTIGATION REPORT

A draft report covering the remedial investigation, the Remedial Investigation Report (RI), will be prepared. The RI report will characterize the site and summarize the data collected and the conclusions drawn from investigative Tasks 2 through 4. The report will be submitted in draft form for review and comment. Upon receipt of comments, a revised report will be prepared and submitted.

TASK 7 - COMMUNITY RELATIONS SUPPORT

A community relations program will be implemented jointly by the U.S. EPA and the MDNR. The responsible parties will cooperate with the U.S. EPA and the MDNR in providing RI/FS information to the public. The responsible parties will, at the request of the U.S. EPA or MDNR, participate in the preparation of information distributed to the public, such as fact sheets, and in public meetings that may be held or sponsored by the U.S. EPA or the MDNR to describe activities at, or concerning, the site, including the findings of the RI/FS.

Community relations support will be consistent with Superfund community relations policy as stated in the "Guidance for Implementing the Superfund Program" and Community Relations in Superfund - A Handbook.

III.**FEASIBILITY STUDY**

The purpose of the FS for the Albion-Sheridan site is to develop alternative remedial actions, based upon the results of the RI, that will mitigate impacts to public health and welfare and the environment.

The FS will conform to CERCLA as amended, the NCP as amended, the RI/FS Guidance as amended, and U.S. EPA policy. The FS is comprised of the four tasks:

- Task 8: Remedial Alternatives Development and Screening
- Task 9: Detailed Analysis of Alternatives
- Task 10: Feasibility Study Report
- Task 11: Additional Requirements

The intent and purpose of each of these tasks is outlined in the following sections; the technical approach and schedule is detailed in the RI/FS Work Plan (Task 1).

TASK 8 - REMEDIAL ALTERNATIVES DEVELOPMENT AND SCREENING

This task constitutes the first stage of the FS and is comprised of five interrelated subtasks. The goal is to develop and evaluate remedial alternatives for additional screening and evaluation. The Baseline Risk Assessment results will be considered throughout the evaluation process.

A. SUBTASK 8A - PRELIMINARY REMEDIAL TECHNOLOGIES

A master list of potentially feasible technologies will be developed that includes both on-site and off-site remedies. The master list will be screened according to site conditions, waste characteristics, and technical requirements, in order to eliminate or modify those technologies that may prove extremely difficult to implement, require unreasonable time periods, or rely on insufficiently developed technology. Emerging technologies being evaluated through the U.S. EPA's SITE Program will also be considered if that information is available. The results of this task will be summarized in a Technical Memorandum that will be submitted to the U.S. EPA and the MDNR.

B. SUBTASK 8B - DEVELOPMENT OF ALTERNATIVES**1. Developing Remedial Response Objectives**

Develop site-specific objectives based on public health and environmental concerns for the Albion-Sheridan site, the

description of the current situation, information gathered during the RI, Section 300.430(e) of the National Contingency Plan (NCP), U.S. EPA's interim guidance, and the requirements of any other applicable U.S. EPA, Federal, and State environmental standards, guidance and advisories as defined under Section 121 of CERCLA. Preliminary cleanup objectives will be developed under formal consultation with the U.S. EPA and the MDNR.

2. Assembling Alternatives for Remedial Actions

Develop a comprehensive, site-specific approach for Remedial Action by assembling combinations of identified technologies that include the following:

- a. Treatment alternatives for source control that eliminate the need for long-term management (including monitoring).
- b. Alternatives involving treatment as a principal element to reduce the toxicity, mobility, or volume of waste.
- c. An innovative technology(ies) if that technology offers the potential for comparable or superior performance or implementability, fewer or lesser adverse impacts than other available approaches, or lower costs for similar levels of performance than demonstrated treatment technologies.

Develop at least two additional alternatives that include the following:

- c. An alternative that involves containment of waste with little or no treatment but protects human health and the environment primarily by preventing exposure to, or reducing the mobility of, the waste.
- d. A no action alternative.

For groundwater response actions, a limited number of remedial alternatives will be developed that attain site-specific remediation levels within different restoration time periods utilizing one or more different technologies. The targeted remediation level is the risk range of 10^{-4} to 10^{-6} for excess upper bound lifetime cancer risk. If feasible, one alternative that would restore groundwater quality to a 10^{-6} risk for maximum lifetime risk level within five years will be configured.

The remedial action alternatives developed for the Albion-Sheridan site may involve both source control and groundwater response

actions. In these instances, the two elements may be formulated together so that the comprehensive remedial action is effective and the elements complimentary. Because each element has different requirements, each will be detailed separately in the development and analyses of alternatives.

C. SUBTASK 8C - INITIAL SCREENING OF ALTERNATIVES

1. Initial Screening Considerations

The alternatives developed under Subtask 8B will be subjected to an initial screening to narrow the list of potential remedial actions for detailed analyses; the rationale for eliminating alternatives will be included. Initial screening considerations include:

a. Effectiveness

The degree to which the alternative to protects human health and the environment; attains Federal and State ARARs or other applicable criteria, advisories, or guidance; significantly and permanently reduces the toxicity, mobility, or volume of the hazardous constituents and are technically reliable and effective in other respects. Reliability considerations include the potential for failure and the need to replace the remedy.

b. Implementability

The degree to which the alternatives is technically feasible and employs available technologies; the technical and institutional ability to monitor, maintain, and replace the technology over time, and the administrative feasibility of implementing the alternative.

c. Cost

An evaluation of construction and long-term costs to operate and maintain the alternative based on conceptual costing information. At this stage of the FS, cost will be used as a factor when comparing alternatives that provide similar results, but not when comparing treatment and non-treatment alternatives. Cost will, however, be a factor in the final remedial selection process, however as described in Task 9.

2. Intent of Alternatives Screening

The initial screening of alternatives incorporating treatment will be conducted with the intent of preserving the most

promising alternatives as determined by their likely effectiveness and implementability. The screening should result in a range of alternatives remaining for further analyses as described previously in Subtask 8B(2).

Innovative alternative technologies will be carried through the screening if there is a reasonable belief they offer either the potential for better treatment performance or implementability, fewer or less adverse impacts than other available approaches, or lower costs for similar performance than the demonstrated technologies.

The containment and no-action alternatives will be carried through the screening process to the detailed analyses.

D. SUBTASK 8D - REMEDIAL ALTERNATIVES ARRAY DOCUMENT

To obtain ARARs from the MDNR, a detailed description of alternatives (including the extent of remediation, contaminant levels to be addressed, and method of treatment) will be prepared. This document will also include a brief site history and background, a site characterization that indicates the contaminants of concern, migration pathways, receptors, and other pertinent site information. A copy of this Alternatives Array Document will be submitted to the U.S. EPA and the MDNR along with the request for a notification of the standards.

F. SUBTASK 8E - DATA REQUIREMENTS

Data requirements specific to the relevant and applicable technologies will be identified. These requirements will focus on providing data needed for the detailed evaluation and development of a preferred alternative.

TASK 9 - DETAILED ANALYSIS OF ALTERNATIVES

The contractor will conduct a detailed analysis of alternatives which will consist of an individual analysis of each alternative against a set of evaluation criteria and a comparative analysis of all options against the evaluation criteria with respect to one another.

The evaluation criteria are as follows:

Overall Protection of Human Health and the Environment addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

Compliance with ARARs addresses whether or not a remedy will meet all of the applicable or relevant and appropriate requirements of

other Federal and State environmental statutes and/or provide grounds for invoking a waiver.

Long-Term Effectiveness and Permanence refers to the ability or a remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met.

Reduction of Toxicity, Mobility, or Volume Through Treatment is the anticipated performance of the treatment technologies a remedy may employ.

Short-Term Effectiveness addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

Cost includes estimated capital and operation and maintenance costs, and net present worth costs.

State Acceptance (Support Agency) addresses the technical or administrative issues and concerns the support agency may have regarding each alternative.

Community Acceptance addresses the issues and concerns the public may have to each of the alternatives.

The individual analysis should include: (1) a technical description of each alternative that outlines the waste management strategy involved and identifies the key ARARs associated with each alternative; and (2) a discussion that profiles the performance of that alternative with respect to each of the evaluation criteria. A table summarizing the results of this analysis should be prepared. Once the individual analysis is complete, the alternatives will be compared and contrasted to one another with respect to each of the evaluation criteria.

The evaluation of alternatives to select the appropriate remedy will satisfy the statutory mandates established in Section 121 of CERCLA, as well as Sections 300.430(a) (i-iii) and 300.430(e) of the NCP. The selected alternative will represent the best balance across all evaluation criteria.

TASK 10 - FINAL FS REPORT

The FS will be prepared in a draft report and submitted for review and comment. Upon receipt of comments, a revised FS report will be prepared and submitted. Deliverables and technical memorandums prepared previously will be summarized and referenced in order to

limit the size of the report. The report will completely document the FS and the process by which the recommended remedial alternative was selected.

SUBMISSION SCHEDULE

<u>Submission</u>	<u>Due Date</u>
Draft Work Plan	60 days after effective date of this Consent Order
Revised Work Plan	30 days after receipt of U.S. EPA comments
Data Evaluation Summary (Task 4)	90 days after completion of fieldwork
Draft RI Report	150 days after completion of fieldwork
Revised RI Report	30 days after receipt of U.S. EPA comments
Alternatives Array Document	150 days after completion of fieldwork
Draft Feasibility Study	90 days after submittal of draft RI Report
Revised Feasibility Study	30 days after receipt of U.S. EPA comments

RECEIVED

JUN 3 1991

U.S. EPA REGION V
OFFICE OF REGIONAL COUNSEL

STATEMENT OF WORK
FOR REMEDIAL DESIGN AND REMEDIAL ACTION
AT
ALBION-SHERIDAN TOWNSHIP LANDFILL SITE
CALHOUN COUNTY, MICHIGAN

TABLE OF CONTENTS

I. PURPOSE.....1

II. DESCRIPTION OF REMEDIAL ACTION.....1

 Site Security.....1

 Restrictive Covenants.....1

 Drummed Waste.....2

 Landfill Cap.....2

 Monitoring Program4

 Contingent Remedy.....6

III. SCOPE OF REMEDIAL DESIGN AND REMEDIAL ACTION.....10

 Task 1: Remedial Design Work
 Plan.....11

 Task 2: Pre-design
Studies.....12

 Task 3: Remedial
Design.....13

 Task 4: Remedial Action Work
Plan.....14

 Task 5: Remedial Action
Construction.....15

 Task 6: Contingent
Remedy.....17

 Task 7: Operation and
Maintenance.....19

 Task 8: Performance
Monitoring.....20

Task 9: Remedial Action	
Completion.....	21
IV. CONTENT OF SUPPORTING	
PLANS.....	22
V. SUMMARY OF MAJOR	
DELIVERABLES/SCHEDULE.....	26

I. PURPOSE

The purpose of this Statement of Work (SOW) is to set forth requirements for implementation of the remedial action set forth in the Record of Decision (ROD), which was signed by the Regional Administrator of U.S. EPA Region V on March 28, 1995, for the Albion-Sheridan Township Landfill Site (Site). The Respondents shall follow the ROD, the SOW, the approved Remedial Design Work Plan, the approved Remedial Action Work Plan, U.S. EPA Superfund Remedial Design and Remedial Action Guidance and any additional guidance provided by U.S. EPA in submitting deliverables for designing and implementing the remedial action at the Albion-Sheridan Township Landfill Site.

II. DESCRIPTION OF THE REMEDIAL ACTION/PERFORMANCE STANDARDS

Respondents shall design and implement the Remedial Action to meet the performance standards and specifications set forth in the ROD and this SOW. Performance standards shall include cleanup standards, standards of control, quality criteria and other substantive requirements, criteria or limitations including all Applicable or Relevant and Appropriate Requirements (ARARs) set forth in the ROD, SOW and/or unilateral Administrative Order (UAO).

1. Site Security

The Respondents shall install and maintain a permanent fence at the Site to prevent access and vandalism to the Site. The fencing of the Site shall consist of a chain link fence around the perimeter of the landfill which is a minimum six-feet high with a minimum three-strand barbed wire. The fence shall encompass at a minimum the landfill waste as shown in Figure 1 of the ROD, except for waste consolidation as required in the ROD. Warning signs shall be posted at 200-foot intervals along the fence and at all gates. The warning signs shall advise that the area is hazardous due to chemicals in the soils which pose a risk to public health through direct contact with soils. The signs shall also provide a telephone number to call for further information. The permanent fence shall be completed within 30 days of the completion of the landfill cap.

2. Restrictive Covenants/Deed Restrictions

Within 60 days after the effective date of this UAO, Respondents shall use best efforts to execute and record with the Calhoun County recorder the restrictive covenants in Appendix E of this UAO to prohibit future development (including, but not limited to, on-site excavations, construction and drilling) of the Site.

In addition, within 30 days after approval of the Pre-design Studies Report, Respondents shall use best efforts to implement institutional controls in the form of deed restrictions or local ordinance to prohibit the installation of any groundwater drinking water well which draws water from the area shown in Figure 4 of the ROD to contain 2 ug/l arsenic or more.

All restrictions regarding future development of the Landfill shall be considered permanent, while U.S. EPA may advise lifting the restrictions regarding the future installations of groundwater drinking water wells when the arsenic levels within the groundwater in the area noted above remain for two years below the MCL.

3. Excavation and Disposal of Drummed Waste

The Respondents shall excavate the test pit area designated TP09 on Figure 5 of the ROD to uncover all drums, as specified in the ROD. Drums found to contain solid or liquid wastes which are structurally sound enough to remove with wastes intact, as determined by U.S. EPA, shall be removed to the staging area for characterization. In addition, all other structurally sound drums containing solid or liquid wastes encountered during consolidation or site preparation shall be removed to the staging area for characterization. Where practical, Respondents shall also remove liquid wastes from structurally unsound drums encountered at TP09 or during consolidation or site preparation and transport it to the staging area for characterization. Respondents shall overpack, as necessary, all excavated drums showing signs of degradation. Respondents shall include all overpacked drums excavated by the MDNR during test pitting, which are temporarily secured on the surface of the landfill, with other excavated drums for characterization and disposal. Respondents shall sample and analyze excavated drum contents for RCRA characterization and dispose off-site, as specified in the ROD, all liquid wastes and those solid wastes found to contain constituents in concentrations exceeding land disposal restrictions, or constituents for which incineration or stabilization as a treatment method is prescribed. Respondents may incorporate those drums containing solid wastes which do not trigger land disposal restrictions under the landfill cap.

4. Construction, Installation, and Maintenance of Landfill Cap

The Respondents shall design and construct an on-site landfill cap that meets or exceeds the substantive requirements of RCRA Subtitle D (40 CFR Part 241) and any more stringent requirements

of Part 115 of the Natural Resources and Environmental Protection Act, 1994 PA 451 (Act 451 Part 115) (formerly known as the Michigan Solid Waste Management Act or Act 641) which are applicable or relevant and appropriate to the Site, as determined by U.S. EPA. Respondents shall cap the entire landfill waste mass shown on Figure 1 of the ROD, including site preparation and layout to re-route surface water drainage away from the capped area. Respondents shall consolidate waste on the east edge of the landfill as specified on page 24 of the ROD. Also as specified on page 24 of the ROD, Respondents shall either consolidate wastes along the south edge of the landfill or acquire the property as specified in the ROD. As specified in the ROD, if the property is acquired, no consolidation of wastes along the south edge is necessary.

Respondents shall grade the landfill to attain grades and slopes required to facilitate drainage and to meet ARARs. Respondents may regrade the landfill as necessary to achieve sub-cap contours approved in the Remedial Design (RD). Respondents may only use off-site materials for fill if those materials are approved by U.S. EPA, in consultation with MDNR, prior to use.

The Respondents shall cover the landfill with a cap constructed, at a minimum, of a gas collection layer, a flexible membrane liner, a drainage layer, cover soil, and topsoil, as specified in the ROD. Respondents shall use cap materials, layer dimensions, and other characteristics as specified in the ROD. Respondents shall perform pre-design studies to determine the short-term and long-term costs and practicability of seeding the vegetative soil layer with native species (59 FR 43122). If U.S. EPA determines that it is practical and the same or less cost than traditional species, native species shall be used by the Respondents.

Prior to construction of the landfill cap, Respondents shall pull casing and seal with grout monitoring wells LF01, LF02, and LF03, which were drilled to the base of the landfill (see Figure 2 of ROD). Prior to the pre-final construction inspection, Respondents shall close and abandon monitoring wells MW-West, MW-South and MW-East (see Figure 8 of Remedial Investigation Report), which were installed prior to U.S. EPA's investigation and cannot be used for reliable sampling. Respondents shall perform this closure and abandonment in accordance with Michigan Act 315 of 1969, The Mineral Well Act.

Respondents shall construct an active landfill gas collection system in a grid network throughout the landfill and shall construct a blower/flare facility to treat the collected gas, as specified on page 25 of the ROD, unless U.S. EPA, in consultation with MDNR, determines that a passive venting system meets requirements of the Clean Air Act, Michigan Act 451 Part 115 and Part 55 of the Natural Resources and Environmental Protection Act, 1994 PA 451 (Act 451 Part 55) (formerly known as the Michigan Air Pollution Control Act or Act 348) standards without treatment. The gas collection or venting wells shall be

constructed to collect gas from the entire area and depth of the landfill.

5. Installation and Operation of Monitoring Program for Remedial Action

Respondents shall implement groundwater and air monitoring programs to evaluate and ensure that the construction and implementation of the Remedial Action comply with approved plans and design documents and performance standards. Respondents shall submit monitoring programs as part of the Remedial Design Work Plan (RD Work Plan), which shall address the specific components of the remedial action listed below. Groundwater and air monitoring samples shall be analyzed for the parameters included in this SOW or for the parameters required and approved by U.S. EPA in the RD.

A. Groundwater Monitoring

The Respondents shall implement a groundwater monitoring program as identified in the RD Work Plan or as required by U.S. EPA. The Respondents shall design the groundwater monitoring program to detect changes in the chemical concentration of the groundwater at and adjacent to the site. After construction of the landfill, Respondents shall monitor groundwater as specified below for at least five years following attainment of the performance standard for arsenic. The groundwater monitoring program shall include, but not be limited to:

- (1) Quarterly sampling of wells identified in Table 1, below, for arsenic, ammonia, pH, Eh, dissolved oxygen and any other parameters identified in the approved RD.
- (2) Quarterly sampling of drinking water wells RW02, RW04, RW05, RW06, RW07, RW08, and RW10 as identified in Figure 10 of the RI Report, for all constituents sampled at residential wells during the RI and any other parameters identified in the approved RD;
- (3) Annual sampling of all wells identified in Table 1, below, for arsenic, ammonia, pH, Eh, dissolved oxygen, aluminum, antimony, benzene, cobalt, 1,2-Dibromo-3-chloropropane, manganese, nickel, and vinyl chloride (i.e., constituents previously found above Michigan Act 307 Type B levels in groundwater at the site), and any other parameters identified in the approved RD;
- (4) Measurement of the ground water elevation whenever a monitoring well is sampled, to confirm groundwater flow directions at the site.

Within the schedule established in the RD Work Plan, Respondents shall install four new monitoring wells at the locations

specified on page 26 of the ROD. Respondents shall vertically sample each of the new monitoring wells, in accordance with current MDNR guidance. During Pre-design Studies, Respondents shall also record the water levels of all existing and new monitoring wells and sample all existing and new monitoring wells for target compound list (TCL) organics, target analyte list (TAL) inorganics, and 1,2-dibromo-3-chloropropane. Respondents shall conduct all analyses using methods which will achieve method detection limits equal to or less than the MCL for each compound or analyte, for those which have an MCL.

Between 50 and 52 months after approval of the Final Design, Respondents shall sample the wells listed in Table 1 for target compound list (TCL) organics, target analyte list (TAL) inorganics, and 1,2-dibromo-3-chloropropane, to assist U.S. EPA in meeting the requirements of Section 121(c) of CERCLA for the first five-year review of the site.

If additional information indicates that the groundwater monitoring program is inadequate, U.S. EPA may require additional groundwater monitoring wells and laboratory analysis of additional parameters. Monitoring wells designated for sampling are noted below. (See RI Report for monitoring well locations).

TABLE 1

<u>MONITORING WELL</u>	<u>FREQUENCY</u>
<u>Shallow Glacial Wells</u>	
MW02SG (background)	annual
MW04SG (WB)	annual
MW05SG (background)	annual
MW07SG	annual
MW09SG	annual
MW10SG	annual
<u>Shallow Bedrock Wells</u>	
MW04SB2	quarterly
MW06SB	quarterly
MW08SB	quarterly
MW09SB	quarterly
MW02SB (background)	quarterly
MW05SB (background)	quarterly
MW07SB	annual
MW15SB (new well)	annual
MW16SB (new well)	annual
MW02SB	annual
<u>Deep Bedrock Wells</u>	
MW09DB (new well)	annual
MW16DB (new well)	annual

B. Air Monitoring

The Respondents shall implement an air monitoring program as identified in the RD Work Plan or as required by U.S. EPA. The Respondents shall design the air monitoring program to detect air emissions from the landfill during and after construction of the landfill. Respondents shall monitor air for the constituents and at the locations and frequency specified in the approved RD. At all times during construction and during all other phases of the Remedial Action, Respondents shall ensure that air emissions do not exceed a cumulative cancer risk of 10^{-6} at the landfill fence line, using risk calculation methods set forth in Risk Assessment Guidance for Superfund. In addition, the air emissions shall not exceed any ARARs, including, but not limited to, the Michigan Act 451 Part 55, if applicable, and the federal Clean Air Act. If air emissions exceed these levels, Respondents shall take corrective measures as developed in the RD.

C. Points of Compliance

In order to monitor and evaluate the remedial actions throughout the Site, certain locations at which there are groundwater monitoring wells shall be selected as points of compliance, pursuant to Task 8 (Performance Monitoring) of the SOW. Wells designated as the Points of Compliance and which shall be sampled are identified in Table 1 of this SOW. All these wells shall be considered as groundwater points of compliance. If any of the wells are destroyed or in any way becomes unusable, the Respondents shall repair or replace each well, unless EPA determines that repair or replacement is not necessary. EPA may designate as points of compliance, additional wells required by the RD Work Plan and the Operation and Maintenance (O&M) Plan. The location of any additional wells installed pursuant to the UAO or this SOW shall be approved by the U.S. EPA.

Points of Compliance for the monitoring and evaluation of the landfill gas collection and flaring shall be addressed in the O&M Plan.

6. Installation and Operation of Contingent Remedy for Groundwater Treatment

A. Implementation of Contingent Remedy

Five years from the date on which construction of the landfill cap is complete, Respondents shall submit to U.S. EPA the results of a statistical test, described in the ROD and in Section III, Task 6 of this SOW, on wells in which the arsenic concentration has exceeded 0.05 mg/l at any time during the monitoring period (currently only MW06SB). From the results of this statistical test, U.S. EPA, in consultation with MDNR, will determine whether arsenic is declining sufficiently fast to fall below 0.05 mg/l within 15 years of completion of the landfill cap. If U.S. EPA determines that any well fails this test, Respondents shall write a Work Plan, conduct pilot testing, design and install a system

for in-situ oxidation of groundwater to restore groundwater to the performance standard. The Respondents shall operate the groundwater treatment system until the groundwater performance standard is met at each of the wells listed in Table 1 and any additional wells designated for performance monitoring in the Final Design for Groundwater Treatment. The groundwater performance standard is 0.05 mg/l arsenic (the MCL).

In accordance with the ROD, Respondents shall also implement this contingent remedy if at any time U.S. EPA determines that the groundwater plume affected by the landfill threatens to raise a residential well which existed on the day the ROD was signed, above 0.05 mg/l arsenic (the MCL).

If the contingent remedy is invoked by U.S. EPA, Respondents shall install and operate an in-situ groundwater treatment system as described on page 27 of the ROD and shown in Figure 7 of the ROD. The treatment system shall consist of a network of wells designed to increase oxidation of all contaminated groundwater that exceeds the MCL for arsenic, in order to increase precipitation of arsenic from the groundwater.

If U.S. EPA determines that no well fails the statistical test in Task 6 of this SOW and that the groundwater plume does not threaten any residential wells, Respondents are not required to implement groundwater treatment. In this case, Respondents shall continue groundwater monitoring for at least five years following attainment of the performance standard for arsenic at all points of compliance.

B. Pilot Testing

If U.S. EPA requires the contingent remedy, Respondents shall pilot-test the in-situ groundwater treatment system, as specified on page 27 of the ROD, to determine whether air or another oxidant is most suitable for the site and to assist with design of the system. Tasks, test and analysis methods, and work schedule for the pilot testing shall be as specified in the approved Work Plan for Groundwater Treatment.

C. Performance Monitoring and Termination

The Respondents shall monitor the system's performance on a regular basis, to assess the progress of groundwater remediation and to verify that the impacted groundwater does not migrate beyond the range of influence of the treatment system, as specified in the Final Design for Groundwater Treatment. At a minimum, performance monitoring shall consist of each of the elements of groundwater monitoring listed under Section 5(a) of this SOW.

The Respondents shall continuously operate the groundwater treatment system until a petition to cease operation is approved in writing by the U.S. EPA, after opportunity for comment by the

MDNR. Any petition to cease operation shall include documentation showing that the groundwater performance standard has been continuously achieved for at least 24 months during operation of the system and for an additional period of at least 2 months following a temporary shutdown of the treatment system as described in the paragraph below. During the 24-month period, Respondents shall collect groundwater samples on a quarterly basis from all monitor wells (i.e., at least 8 samples from each compliance point). Samples collected during this 24-month period shall be analyzed for arsenic, ammonia, pH, Eh, and dissolved oxygen.

The petition to cease operation of the groundwater treatment system shall include monitoring of the water quality in the aquifer after treatment has been temporarily stopped. This temporary shutdown of the system shall be sufficiently long as is necessary to allow the 3dimensional groundwater flow system and chemical equilibrium to attain the steady-state condition which will exist when groundwater remediation has ceased. At a minimum, a series of samples taken at time after shutdown intervals of 1 hour, 1 day, 1 week, and approximately 60 days are required. The Respondents shall maintain the temporary shutdown of the treatment system for no more than 60 days. The Respondents shall restart the groundwater treatment system and continue its operation until a petition to cease operation is approved in writing by U.S. EPA.

U.S. EPA will consider the groundwater to have achieved the performance standard if the distribution of these data show that the 95% one-sided confidence interval of the arsenic concentration for the last 24 months at each selected monitoring point is equal to or less than the groundwater performance standard. See U.S. EPA Guidance "Methods for Evaluating the Attainment of Cleanup Standards, Volume 2: Ground Water", and any amendment to that guidance. Upon U.S. EPA's approval of the petition to cease operation, Respondents may terminate the groundwater treatment system.

D. Notification of Temporary Shutdown of the Groundwater Treatment System

For any interruption of any portion of the groundwater treatment system, Respondents shall describe the nature and cause of the interruption, the length of time of the interruption, and measures that have been taken to prevent further shutdowns in Respondents' next scheduled progress report. If for any reason during the operation of the groundwater treatment system, the operation of any portion is interrupted or stopped for a period of 24 hours or more, whether due to mechanical failure, human error, or any other reason (except for scheduled maintenance), the Respondents shall notify U.S. EPA and MDNR within 24 hours after learning of such interruption or cessation of operation. Notification shall include information on the nature and cause of the interruption or cessation as well as the estimated time

before operation of the system shall resume. The Respondents also shall notify U.S. EPA and MDNR upon reactivation of the system. In cases where cessation of operation exceed two weeks, Respondents shall provide progress reports to U.S. EPA periodically by telephone or in writing addressing measures being taken to repair, complete maintenance, or other steps taken to timely resume operation.

The Respondents shall notify U.S. EPA and MDNR of scheduled maintenance that requires shut down of any portion of the groundwater treatment system as soon as such maintenance has been scheduled. Notification shall include providing information on scope and extent of work, estimated down time of the system, and contingency plans for unexpected problems or schedule delays.

In all cases where there is an interruption or cessation in the operation of any portion of the groundwater treatment system, whether due to mechanical failure, human error, or to perform routine maintenance, as well as any other reason, the Respondents shall use their best efforts to repair, complete maintenance, or take any other steps necessary to timely resume the operation of the system.

E. Correction of Deficiencies

If U.S. EPA, upon review of monitoring data and other information, determines that the treatment system is insufficient such that (a) the arsenic concentration in groundwater is not decreasing at the rate necessary to achieve the performance standard sufficient to meet the time estimate in the Record of Decision, or (b) adverse hydrologic consequences are occurring, U.S. EPA, after opportunity for comment by the MDNR, may require changes in the treatment system to correct any deficiencies. Examples of such changes include, but are not limited to, changes in numbers or locations of groundwater treatment wells and/or changes in the rate of addition of oxidants to the aquifer. Upon determination of a deficiency, Respondents shall submit a work plan for the additional response actions no later than 30 days after receipt of written notice from U.S. EPA, unless an active drinking water well is affected, in which case Respondents shall initiate appropriate corrective action as soon as possible after oral notice is received from U.S. EPA, which shall then be followed by written notice as soon as practicable. The work plan shall include a detailed description of measures which the Respondents will take to correct the treatment system, a schedule for each major activity and for submission of deliverables generated during the action, including specific dates for completion of the project.

The work plan shall include any revisions to the QAPP, Site Health and Safety Plan, and Field Sampling Plan needed for the action. Upon approval of the work plan, the Respondents shall implement the work plan in accordance with the schedule contained therein.

If any of the groundwater treatment wells are destroyed or in any way become unusable, the Respondents shall repair or replace each such well to the extent practicable. The location of any additional wells installed pursuant to the UAO or this SOW shall be approved by the U.S. EPA.

F. Post-Shutdown Monitoring and Restart

After discontinuing operation of the groundwater treatment system pursuant to Subpart 6C, above, the Respondents shall thereafter perform annual monitoring of each well listed in Table 1, in order to verify that the groundwater performance standard is being maintained. Upon written approval of U.S. EPA, in consultation with MDNR, Respondents may decrease the number of wells for post-shutdown monitoring. Post-shutdown sampling shall include arsenic, ammonia, pH, Eh, dissolved oxygen, aluminum, antimony, benzene, cobalt, 1,2-Dibromo-3-chloropropane, manganese, nickel, and vinyl chloride (i.e., constituents previously found above Michigan Act 307 Type B levels in groundwater at the site), and any other parameters identified in the approved RD. Such monitoring shall continue until the Respondents demonstrate that the performance standard established in the ROD and SOW have been continuously satisfied for five years following final shutdown of the groundwater treatment system.

If post-shutdown groundwater monitoring indicates that the 95% one-sided confidence interval of arsenic's concentration at any selected monitoring point has increased above the groundwater performance standard after groundwater treatment has been terminated in accordance with Subpart 6C, above, the Respondents shall reactivate the groundwater treatment system. If the Respondents are required to reactivate the system, the Respondents shall thereafter operate and maintain the groundwater treatment system until they again demonstrate compliance with the groundwater performance standard as provided in Subpart 6A and the shutdown requirements of Subpart 6C..

III. SCOPE OF REMEDIAL DESIGN AND REMEDIAL ACTION

The Remedial Design/Remedial Action shall consist of nine tasks. All plans are subject to EPA approval.

Task 1: Remedial Design Work Plan

Task 2: Pre-design Studies

Task 3: Remedial Design

Task 4: Remedial Action Work Plan

Task 5: Remedial Action Construction

- Task 6: Contingent Remedy
- Task 7: Operation and Maintenance
- Task 8: Performance Monitoring
- Task 9: Remedial Action Completion

Unless otherwise specified by U.S. EPA, Respondents shall provide two copies of all submittals to the U.S. EPA Remedial Project Manager, two copies to the U.S. EPA oversight contractor, and two copies to the MDNR project coordinator. One of the two copies sent to U.S. EPA and the MDNR must be unbound. For Monthly Progress Reports, one copy should be sent to U.S. EPA and one copy to the State. Respondents shall comply with all Plans submitted with the Remedial Design, and shall comply with the Final Project Schedule established in the Remedial Design.

As specified in Section XV of the UAO, within 15 days after the effective date of the UAO, Respondents shall notify U.S. EPA in writing of the name, title, and qualifications of any contractor proposed to be the Project Coordinator for implementation of the UAO. Following this notification, U.S. EPA will issue a notice of disapproval or an authorization to proceed. If instead the supervising function is to be performed by a Respondent, Respondents will notify U.S. EPA of his or her name and title. **[NEED TO ADD SOMETHING LIKE -- Respondents shall also notify U.S. EPA of the Remedial Design Contractor, if they are different from the Project Coordinator, within 10 days of their selection].**

Task 1: Remedial Design Work Plan

The Respondents shall submit a Remedial Design (RD) Work Plan which shall document the overall management strategy for performing the design, for U.S. EPA review and approval. The plan shall document the responsibility and authority of all organizations and key personnel involved with the implementation and shall include a description of qualifications of key personnel directing the RD, including contractor personnel. The plan shall also contain a schedule of all RD activities, including pre-design field work, Pre-design Studies Report and design submittals. The Respondents shall submit a RD Work Plan in accordance with § XII and Paragraph 10 of the UAO and Section V of this SOW.

In addition to the overall management strategy and schedule, the RD Work Plan also include the following:

1. Quality Assurance Project Plan (QAPP);
2. Site Health and Safety Plan;
3. Field Sampling Plan;
4. Plans for installation of additional groundwater monitoring wells and gas emissions studies;

5. Plans for completing any site access not previously obtained;
6. Plans for obtaining restrictive covenants for groundwater; and
7. Plans for assisting U.S. EPA in community involvement when requested by U.S. EPA.

The QAPP, Site Health and Safety Plan, and Field Sampling Plan shall cover all pre-design and design tasks, and to the extent possible, shall accommodate the Remedial Action as well, so that minimal revision is needed prior to construction. These plans shall include each of the elements listed in Section IV of this SOW.

In the plans for completing site access, Respondents shall use best efforts, consistent with Section XVI of the UAO, to secure site access for the Respondents, the United States and its representatives, as necessary to effectuate the UAO, including the payment of reasonable sums of money in consideration of access.

Task 2: Pre-design Studies

This Remedial Action requires pre-design studies to supplement the available technical data. These pre-design studies include, but are not limited to:

1. Native species revegetation study;
2. Gas emissions study;
3. Installation of four additional monitoring wells;
4. Groundwater sampling

The Respondents shall evaluate the costs and practicability of revegetating the landfill cap with native species, and evaluate gas emissions from the landfill, as described on page 25 of the ROD and page 3 of this SOW. The Respondents also shall install new monitoring wells, and sample new and existing wells, as described on page 26 of the ROD and page 4 of this SOW.

The Respondents shall implement the pre-design studies in accordance with the final RD Work Plan. The results of the pre-design studies shall be submitted in a Pre-design Studies Report which shall be submitted within the schedule approved in the final RD Work Plan.

Task 3: Remedial Design

Respondents shall prepare construction plans and specifications to implement the Remedial Actions at the Site as described in the ROD and this SOW. Plans and specifications shall include each of the items listed in Section IV of this SOW and shall be submitted in accordance with the schedule set forth in Section V below. Subject to approval by U.S. EPA, Respondents may submit more than one set of design submittals reflecting different components of

the Remedial Action. All plans and specifications shall be developed in accordance with U.S. EPA's Superfund Remedial Design and Remedial Action Guidance (OSWER Directive No. 9355.0-4A) and shall demonstrate that the Remedial Action shall meet all objectives of the ROD, the UAO and this SOW, including all performance standards. Respondents shall meet regularly with U.S. EPA to discuss design issues.

A. Preliminary Design

Respondents shall submit the Preliminary Design when the design effort is approximately 30 % complete. The Preliminary Design submittal shall include or discuss, at a minimum, the following:

- ❖ Preliminary plans, drawings, and sketches, including design calculations;
- ❖ Design assumptions and parameters, including design restrictions, process performance criteria, appropriate unit processes for the treatment train, and expected removal or treatment efficiencies for both the process and waste (concentration and volume);
- ❖ Proposed cleanup verification methods, including compliance with Applicable or Relevant and Appropriate Requirements (ARARs);
- ❖ Outline of required specifications;
- ❖ Proposed siting/locations of processes/construction activity;
- ❖ Expected long-term monitoring and operation requirements;
- ❖ Real estate, easement, and permit requirements;
- ❖ Preliminary construction schedule, including contracting strategy.
- ❖ Draft Performance Monitoring Plan;
- ❖ Draft Construction Quality Assurance Plan;
- ❖ Draft Contingency Plan (unless included in Site Health and Safety Plan)

B. Intermediate Design Meeting

When the design is approximately 60% complete, Respondents shall notify U.S. EPA and MDNR for the purpose of scheduling an intermediate design meeting. At this meeting, Respondents shall present an overview of the current status of the design and present any design issues which should be brought to the

attention of U.S. EPA.

C. Final Design

Respondents shall submit the Final Design when the design effort is 100% complete. The Final Design shall fully address all comments made to the preceding design submittal. The Final Design shall include reproducible drawings and specifications suitable for bid advertisement. The Final Design shall include those elements listed for the Preliminary Design, as well as, the following:

- ❖ Final Performance Monitoring Plan;
- ❖ Final Construction Quality Assurance Plan;
- ❖ Final Contingency Plan (unless included in Site Health and Safety Plan)
- ❖ Draft Operation and Maintenance Plan;
- ❖ Capital and Operation and Maintenance Cost Estimate.

The Respondents shall review the Draft Operation and Maintenance Plan following construction and shall submit a Final Operation and Maintenance Plan to U.S. EPA no later than the date of the Pre-final Construction Inspection.

Task 4: Remedial Action Work Plan

The Respondents shall submit a Remedial Action (RA) Work Plan which includes a detailed description of the remediation and construction activities. The RA Work Plan shall include a project schedule for each major activity and submission of deliverables generated during the Remedial Action, including specific dates for completion of the project. The Respondents shall submit a RA Work Plan in accordance with § XII and Paragraph 36 of the UAO and Section V of this SOW.

The RA Work Plan shall include as attachments an RA QAPP and an RA Site Health and Safety Plan. The RA Work Plan shall also include any revisions to the Field Sampling Plan needed for Remedial Action.

If some or all of the RA is to be performed by contractor(s), the RA Work Plan shall include plans to provide U.S. EPA with copies of all bid specifications, if they have not been provided previously. The RA Work Plan shall also include a schedule for the Respondents' pre-bid meeting, bid review, and contract award.

Task 5: Remedial Action Construction

The Respondents shall implement the Remedial Action as detailed in the approved Final Design and approved Remedial Action Work Plan. The following activities shall be completed in constructing the Remedial Action.

A. Preconstruction inspection and meeting:

The Respondents shall participate with the U.S. EPA and the Michigan Department of Natural Resources (MDNR) in a preconstruction inspection and meeting to:

- a. Review methods for documenting and reporting inspection data;
- b. Review methods for distributing and storing documents and reports;
- c. Review work area security and safety protocol;
- d. Discuss any appropriate modifications of the construction quality assurance plan to ensure that site-specific considerations are addressed; and,
- e. Conduct a Site walk-around to verify that the design criteria, plans, and specifications are understood and to review material and equipment storage locations.

The preconstruction inspection and meeting shall be documented by a designated person and minutes shall be transmitted to all parties.

B. Prefinal Construction Inspection:

Within 30 days after Respondents make a preliminary determination that construction is complete, the Respondents shall notify the U.S. EPA and the MDNR for the purposes of conducting a prefinal construction inspection. The prefinal construction inspection shall consist of a walk-through inspection of the entire Facility with U.S. EPA and the MDNR. The inspection is to determine whether the project is complete and consistent with the contract documents and the Remedial Design. Any outstanding construction items discovered during the inspection shall be identified and noted. Additionally, treatment equipment, if any, shall be operationally tested by the Respondents. The Respondents shall certify that the equipment has performed to meet the purpose and intent of the specifications. Retesting shall be completed where deficiencies are revealed.

C. Final Construction Inspection:

Within 15 days after completion of any work identified in the

prefinal construction inspection report, the Respondents shall notify the U.S. EPA and the MDNR for the purposes of conducting a final construction inspection. The final construction inspection shall consist of a walk-through inspection of the Facility by U.S. EPA and the Respondents. The prefinal construction inspection report shall be used as a checklist with the final construction inspection focusing on the outstanding construction items identified in the prefinal construction inspection. At the final construction inspection, Respondents shall confirm that outstanding items have been resolved.

1. Prefinal Construction Inspection Report

Within 15 days of the prefinal construction inspection, the Respondents shall submit a Prefinal Construction Inspection Report which outlines the outstanding construction items, actions required to resolve outstanding items, completion dates for these items, and includes a proposed date for the final construction inspection. The Prefinal Construction Inspection Report may be submitted in the form of a punch list or a letter.

2. Final Construction Report

Within 30 days of a successful final construction inspection, Respondents shall submit a Final Construction Report. In the report, a registered professional engineer and the Respondents' Project Coordinator shall state that the Remedial Action has been constructed in accordance with the design and specifications. The Final Construction Report shall contain the following statement, signed by a responsible corporate official of a Respondent or the Respondents' Project Coordinator:

"To the best of my knowledge, after thorough investigation, I certify that the information contained in or accompanying this submission is true, accurate and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

The final construction report shall include, but not be limited to, the following elements:

- a. Chronology of events;
- b. Summary of Performance Standards and Construction Quality Control;
- c. Summary of construction activities;
- d. Summary of final construction inspection;
- e. Certification of the design and construction;
- f. As-built drawings signed and stamped by a professional

engineer;

- g. Explanation of any modifications to the Remedial Design and why these were necessary for the project;
- h. Certification that the remedy is functioning properly and is performing as designed;
- i. Explanation of operation and maintenance, including monitoring, to be undertaken at the site and any changes required based on modification of site plans during construction; and
- j. Summary of project costs.

Task 6: Contingent Remedy

If so directed by U.S. EPA, in consultation with the MDNR, the Respondents shall implement all tasks applicable to the contingent remedy, as specified on pages 26 through 28 of the ROD.

A. Contingent Remedy Groundwater Monitoring Report

No earlier than 58 months and no later than 60 months following the Respondents' submittal of the final construction report, the Respondents shall submit a Contingent Remedy Groundwater Monitoring Report. This report shall include results of a statistical test on each monitoring well in which the arsenic concentration exceeded 0.05 mg/l during any sampling event. For each such well, Respondents shall submit a time plot of arsenic concentration over the five year period. For those wells at which a downward trend is present, Respondents shall use a regression, time series, or other model approved by U.S. EPA, to predict the date at which arsenic concentrations will meet 0.05 mg/l arsenic, assuming that the observed trend continues. If the data do not exhibit serial correlation, Respondents shall use a regression model to estimate a linear or nonlinear trend for the subset of data which represent a downward trend. If the data do exhibit serial correlation, Respondents shall use a time series model in lieu of a regression model on the same subset of data. Another method may be used if approved by U.S. EPA.

B. Work Plan, Pilot Testing, and Design of Groundwater Treatment System

Within 60 days after notification from U.S. EPA that the contingent remedy must be implemented, the Respondents shall submit a Work Plan for Groundwater Treatment. The plan shall document the overall management strategy for performing the pilot testing, design, construction, and operation of the treatment system, for U.S. EPA review and approval. The plan shall document the responsibility and authority of all organizations and key personnel involved with the implementation and shall

include a description of qualifications of key personnel, including contractor personnel.

The Work Plan for Groundwater Treatment also must include the following items:

- a. Detailed plans for pilot testing and a schedule for submittal of a Pilot Testing Report for Groundwater Treatment;
- b. A schedule for submittal of Preliminary and Final Design for Groundwater Treatment;
- c. A preliminary schedule for a pre-construction meeting, pre-final and final inspections, Completion of Construction Report, and Completion of Work Report.
- d. Plans and schedule for selection of contractor; and
- e. Construction schedule, including completion of construction.

The Work Plan for Groundwater Treatment shall also include any necessary updates to the approved Quality Assurance Project Plan (QAPP), Site Health and Safety Plan, and Field Sampling Plan. The plan shall also include any additional plans for site access which are necessary for the contingent remedy.

Upon U.S. EPA approval of the Work Plan for Groundwater Treatment, Respondents shall conduct Pilot Studies to determine whether air or another oxidant is most suitable for the site and to assist with design of the system. Respondents shall submit a Pilot Studies Report, a Preliminary Design and a Final Design within the schedule approved in the Work Plan.

The Preliminary and Final Design shall include each of the items listed under Task 3 of this SOW, unless notified in writing by U.S. EPA that certain elements are not necessary.

C. Construction of Groundwater Treatment System

Within 90 days of U.S. EPA approval of the Final Design, Respondents shall award contract(s) for the groundwater treatment system. Respondents shall initiate and complete construction of the groundwater treatment system within the schedule approved in the Work Plan for Groundwater Treatment.

Upon completion of construction of the groundwater treatment system, the Respondents shall complete each of the items listed under Task 5 as they apply to the groundwater treatment system, including notification of U.S. EPA for pre-final and final construction inspections and submittal of pre-final and final construction reports.

Task 7: Operation and Maintenance

The Respondents shall prepare an Operation and Maintenance (O&M) Plan to cover both implementation and long term maintenance of the Remedial Actions. An initial Draft O&M Plan shall be submitted as a final Design Document submission. The final O&M Plan shall be submitted to U.S. EPA prior to the pre-final construction inspection, in accordance with the approved construction schedule. The plan shall be composed of the following elements:

1. Description of normal operation and maintenance ;
 - a. Description of tasks for operation;
 - b. Description of tasks for maintenance;
 - c. Description of prescribed treatment or operation conditions; and
 - d. Schedule showing frequency of each O&M task.
2. Description of potential operating problems;
 - a. Description and analysis of potential operation problems;
 - b. Sources of information regarding problems; and
 - c. Common and/or anticipated remedies.
3. Description of routine monitoring and laboratory testing;
 - a. Description of monitoring tasks;
 - b. Description of required data collection, laboratory tests and their interpretation;
 - c. Required quality assurance, and quality control ;
 - d. Schedule of monitoring frequency and procedures for a petition to U.S. EPA to reduce the frequency of or discontinue monitoring; and
 - e. Description of verification sampling procedures if cleanup or performance standards are exceeded in routine monitoring.
4. Description of alternate O&M;
 - a. Should systems fail, alternate procedures to prevent release or threatened releases of hazardous substances, pollutants or contaminants which may endanger public health and the environment or exceed performance standards; and
 - b. Analysis of vulnerability and additional resource requirement should a failure occur.
5. Corrective Action;
 - a. Description of corrective action to be implemented in the event that cleanup or performance standards are exceeded; and

- b. Schedule for implementing these corrective actions.
- 6. Safety plan;
 - a. Description of precautions, of necessary equipment, etc., for Site personnel; and
 - b. Safety tasks required in event of systems failure.
- 7. Description of equipment; and
 - a. Equipment identification;
 - b. Installation of monitoring components;
 - c. Maintenance of Site equipment; and
 - d. Replacement schedule for equipment and installed components.
- 8. Records and reporting mechanisms required.
 - a. Daily operating logs;
 - b. Laboratory records;
 - c. Records for operating costs;
 - d. Mechanism for reporting emergencies;
 - e. Personnel and maintenance records; and
 - f. Monthly/annual reports to State agencies.

Task 8: Performance Monitoring

Respondents shall implement performance monitoring as approved in the Remedial Design to ensure that all performance standards are met. The performance monitoring program shall assess the performance of drum removal and treatment, construction of landfill cap and landfill gas collection system, groundwater monitoring program, and, if implemented, the groundwater treatment system. In the monthly progress reports required under Section XI of the UAO, Respondents shall submit details concerning progress toward attainment of performance standards for each remedial action task which is in progress.

If requested by U.S. EPA pursuant to Section VIII of the UAO, the Respondents shall conduct any additional investigations and shall submit any additional reports required by U.S. EPA in order to permit U.S. EPA to meet the five-year review requirements of Section 121(c) of CERCLA and applicable regulations.

Task 9: Remedial Action Completion

A. Completion of Remedial Action

After receiving notice from U.S. EPA that either a) the contingent remedy will not be invoked, or b) a petition to cease operation of the groundwater treatment system has been approved,

Respondents shall assess the Remedial Action to determine whether all performance standards have been attained. Within 90 days of Respondents' assessment that performance standards have been attained and Remedial Action is fully performed except for long-term groundwater monitoring and operation and maintenance of the landfill, Respondents shall notify U.S. EPA and the MDNR for the purpose of conducting a pre-certification inspection for completion of remedial action.

Within 30 days of a successful final inspection, Respondents shall submit a Completion of Remedial Action Report. The written report shall include as-built drawings signed and stamped by a professional engineer for any construction changes or any construction not included in the Final Construction Report. The Completion of Remedial Action Report shall contain the following statement, signed by a responsible corporate official of a Respondents or the Respondents' Project Coordinator:

"To the best of my knowledge, after thorough investigation, I certify that the information contained in or accompanying this submission is true, accurate and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

B. Completion of Work

Within 90 days of Respondents' assessment that all phases of work at the site are complete, except for long-term operation and maintenance of the landfill, Respondents' shall notify U.S. EPA and the MDNR for the purpose of conducting a pre-certification inspection for completion of work.

Within 30 days of completion of all groundwater monitoring required by the ROD, UAO and this SOW, Respondents shall submit a Completion of Work Report. In the report, a registered professional engineer and the Respondents' Project Coordinator shall state the Remedial Action has been completed in full satisfaction of the requirements of this UAO. The written report shall include as-built drawings signed and stamped by a professional engineer not previously submitted. The report shall contain the statement listed under Task 9A above.

IV CONTENT OF SUPPORTING PLANS

The documents listed in this section -- the Quality Assurance Project Plan, the Field Sampling Plan, the Health and Safety Plan, the Contingency Plan and the Construction Quality Assurance Plan -- are documents which must be prepared and submitted as outlined in Section III of this SOW. The following section describes the required contents of each of these supporting plans.

Because similar tasks may be performed at different points in the Remedial Action, e.g., with respect to implementation of the contingent remedy, a single QAPP, a single Health and Safety Plan (and Contingency Plan), a single Field Sampling Plan, a single Construction Quality Assurance Plan, may be prepared. These documents, however, may be supplemented to reflect successive tasks. Such amendments shall be approved by U.S. EPA, in consultation with MDNR, and shall be submitted to U.S. EPA as addenda to the original plans.

A. Quality Assurance Project Plan

The Respondents shall develop a Site specific Quality Assurance Project Plan (QAPP), covering sample analysis and data handling for samples collected in all phases of future Site work, based upon the UAO and guidance provided by U.S. EPA. The QAPP shall be consistent with the requirements of the EPA Contract Lab Program (CLP) for laboratories proposed outside the CLP. The Region 5 model QAPP will be provided to the Respondents to facilitate preparation of the QAPP. The QAPP shall at a minimum include:

Project Description

- * Facility Location History
- * Past Data Collection Activity
- * Project Scope
- * Sample Network Design
- * Parameters to be Tested and Frequency
- * Project Schedule

Project Organization and Responsibility

Quality Assurance Objective for Measurement Data

- * Level of Quality Control Effort
- * Accuracy, Precision and Sensitivity of Analysis
- * Completeness, Representativeness and Comparability

Sampling Procedures

Sample Custody

- * Field Specific Custody Procedures
- * Laboratory Chain of Custody Procedures

Calibration Procedures and Frequency

- * Field Instruments/Equipment
- * Laboratory Instruments

Analytical Procedures

- * Non-Contract Laboratory Program Analytical Methods
- * Field Screening and Analytical Protocol

* Laboratory Procedures

Internal Quality Control Checks

- * Field Measurements
- * Laboratory Analysis

Data Reduction, Validation, and Reporting

- * Data Reduction
- * Data Validation
- * Data Reporting

Performance and System Audits

- * Internal Audits of Field Activity
- * Internal Laboratory Audit
- * External Field Audit
- * External Laboratory Audit

Preventive Maintenance

- * Routine Preventative Maintenance Procedures and Schedules
- * Field Instruments/Equipment
- * Laboratory Instruments

Specific Routine Procedures to Assess Data Precision,

Accuracy, and Completeness

- * Field Measurement Data
- * Laboratory Data

Corrective Action

- * Sample Collection/Field Measurement
- * Laboratory Analysis

Quality Assurance Reports to Management

The Respondents shall attend a pre-QAPP meeting with U.S. EPA. The Respondents shall submit a draft QAPP to U.S. EPA for review and approval.

B. Site Health and Safety Plan

The Respondents shall develop a health and safety plan which is designed to protect on-site personnel and area residents from physical, chemical and all other hazards posed by this remedial action. The safety plan shall develop the performance levels and criteria necessary to address the following areas.

Facility Description

Personnel

Levels of protection

Safe work practices and safe guards

Medical surveillance

Personal and environmental air monitoring

Personal protective equipment

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Personal hygiene
Decontamination - personal and equipment
Site work zones
Contaminant control
Contingency and emergency planning
Logs, reports and record keeping

The safety plan shall follow U.S. EPA guidance and all OSHA requirements as outlined in 29 CFR 1910 and 1926.

Contingency Plan [Stand alone or in Site Health and Safety Plan]

Respondents shall submit a Contingency Plan describing procedures to be used in the event of an accident or emergency at the site. The draft Contingency Plan shall be submitted with the prefinal design and the [draft] final Contingency Plan shall be submitted with the final design. [The final Contingency Plan shall be submitted prior to the start of construction, in accordance with the approved construction schedule.] The Contingency Plan shall include, at a minimum, the following:

1. Name of the person or entity responsible for responding in the event of an emergency incident.
2. Plan and date(s) for meeting(s) with the local community, including local, State and Federal agencies involved in the cleanup, as well as local emergency squads and hospitals.
3. First aid medical information.
4. Air Monitoring Plan (if applicable).
5. Spill Prevention, Control, and Countermeasures (SPCC) Plan (if applicable), as specified in 40 CFR Part 109 describing measures to prevent and contingency plans for potential spills and discharges from materials handling and transportation.

C. Field Sampling Plan

The Respondents shall develop a field sampling plan (as described in "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA," October 1988). The Field Sampling Plan should supplement the QAPP and address all sample collection activities.

D. Construction Quality Assurance Plan

Respondents shall submit a Construction Quality Assurance Plan (CQAP) which describes the Site specific components of the quality assurance program which shall ensure that the completed project meets or exceeds all design criteria, plans, and specifications. The draft CQAP shall be submitted with the

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prefinal design and the [draft] final CQAP shall be submitted with the final design. [The final CQAP shall be submitted prior to the start of construction in accordance with the approved construction schedule.] The CQAP shall contain, at a minimum, the following elements:

1. Responsibilities and authorities of all organizations and key personnel involved in the design and construction of the Remedial Action.
2. Qualifications of the Quality Assurance Official to demonstrate he possesses the training and experience necessary to fulfill his identified responsibilities.
3. Protocols for sampling and testing used to monitor construction.
4. Identification of proposed quality assurance sampling activities including the sample size, locations, frequency of testing, acceptance and rejection data sheets, problem identification and corrective measures reports, evaluation reports, acceptance reports, and final documentation. A description of the provisions for final storage of all records consistent with the requirements of the unilateral Administrative Order shall be included.
5. Reporting requirements for CQA activities shall be described in detail in the CQA plan. This shall include such items as daily summary reports, inspection data sheets, problem identification and corrective measures reports, design acceptance reports, and final documentation. Provisions for the final storage of all records shall be presented in the CQA plan.

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V. SUMMARY OF MAJOR DELIVERABLES/SCHEDULE

A summary of the project schedule and reporting requirements contained in this SOW is presented below:

<u>Submission</u>	<u>Due Date</u>
1. Notify U.S. EPA of Project effective Coordinator	Within 15 days of date of the UAO
2. RD Work Plan	Sixty (60) days after Notice of Authorization to proceed with RD
3. Pre-design Studies Report Work	As approved in the RD Plan
4. Preliminary Design (30%)	Forty-five (45) days after U.S. EPA's approval of Pre-design Studies Report
5. Intermediate Design Meeting	Thirty (30) days after
6. Final Design (100%)	Thirty (30) days after Intermediate Design Meeting
7. RA Work Plan	Thirty (30) days after approval of Final Design
8. Award Construction Contract(s)	Thirty (30) days after approval of RA Work Plan

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| 9. | Pre-Construction Inspection and Meeting | Fifteen (15) days after Award of RA Contract(s) |
| 10. | Initiate Construction of RA | Fifteen (15) days after Pre-Construction Inspection and Meeting |
| 11. | Completion of Construction | As approved by U.S. EPA in RA Work Plan |
| 12. | Prefinal Construction Inspection | Thirty (30) days after Respondents' assessment that construction is complete |
| 13. | Final O&M Plan | No later than Prefinal Construction Inspection |
| 14. | Prefinal Construction Inspection Report | Fifteen (15) days after Prefinal Construction Inspection |
| 15. | Final Construction Inspection | Fifteen (15) days after completion of work identified in Prefinal Construction Inspection Report |
| 16. | Final Construction Report | Thirty (30) days after Final Construction Inspection |
| 17. | Contingent Remedy Groundwater | 58 to 60 months after |



Items 18 through 23 will be due only if the Contingent Remedy is required:

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|---|---|
| 18. Work Plan for Groundwater Treatment | Sixty (60) days after notice that Contingent Remedy is required |
| 19. Pilot Studies Report for Groundwater Treatment | As approved in Work Plan for Groundwater Treatment |
| 20. Preliminary Design for Groundwater Treatment | As approved in Work Plan for Groundwater Treatment |
| 21. Final Design for Groundwater for Treatment | As approved in Work Plan for Groundwater Treatment |
| 22. Award RA Contract for Groundwater Treatment | Ninety (90) days after U.S.EPA approval of Final Design |
| 23. Initiate/Complete Construction | As approved in Work Plan for Groundwater Treatment |
| 24. Construction Inspections and Construction Reports for Groundwater Treatment | As specified in Task 5 of this SOW |
| 25. Pre-certification Inspection For Completion of RA | Ninety (90) days from Respondents' assessment that Remedial Action is fully performed and performance standards attained. |
| 26. Completion of Remedial Action | Thirty (30) days after |
| 27. Pre-certification Inspection for Completion of Work | Ninety (90) days after all phases of work performed |

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- 28. Completion of Work Report
Thirty (30) days after
Precertification
Inspection for Completion
of Work
- 29. Monthly Progress Reports
Tenth day of each month
following the effective
date of the UAO until
U.S. EPA issues
Certification of
Completion.
- 30. Monitoring Reports
As specified in the
Performance Monitoring
Plan of the approved RD
- 31. Work Plan for Additional
Response Actions, if required
Thirty (30) days after
receipt of notice from
U.S. EPA that additional
response actions are
necessary

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**STATEMENT OF WORK FOR CONDUCTING A
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
AT THE ALBION-SHERIDAN TOWNSHIP LANDFILL SITE,
ALBION, MICHIGAN**

This document is the Statement of Work (SOW) for conducting a Remedial Investigation (RI) and Feasibility Study (FS) at the Albion-Sheridan Township Landfill ("Albion-Sheridan") NPL site located in Calhoun County, Michigan. The purpose of this SOW is to provide the direction and intent of the RI/FS. Within 60 days of the effective date of the Consent Order a RI/FS Work Plan shall be submitted based on this SOW that provides detailed guidance on the execution of the RI/FS.

The purpose of the RI is to investigate the site's physical characteristics, identify the sources of contamination, and determine the nature and extent of contamination at the Albion-Sheridan site. The purpose of the FS is to develop and evaluate remedial action alternatives based on the RI data and report. All personnel, materials, and services required to perform the RI/FS will be provided by the Potentially Responsible Parties (PRPs).

The tasks described herein are grouped into the following three categories:

- o Plans and Management,
- o Remedial Investigation (RI), and
- o Feasibility Study (FS).

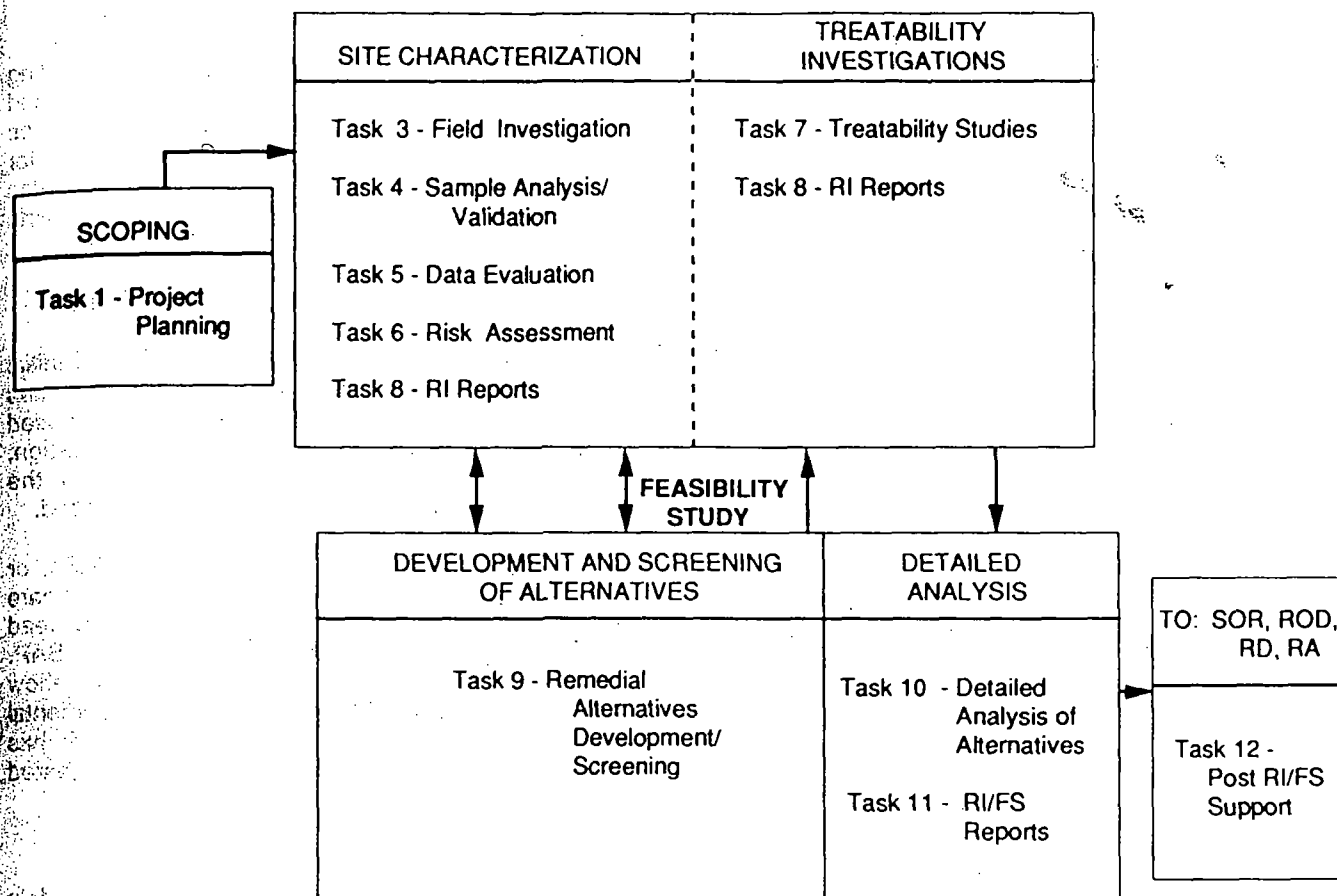
The Work Plan developed pursuant to this SOW will present a phased approach that recognizes the interdependency of the RI and FS. The data collected in the RI influences the development of remedial alternatives in the FS, which in turn affects the data needs and scope of treatability studies and additional field investigations. The overall organization and interactive nature of this approach are illustrated in Figure 1.

The primary intent of the phased approach is to minimize the need for conducting post-FS or supplemental RI/FS activities by thorough characterization of the migration pathways and early identification of the site specific data requirements associated with the applicable remedial technology.

Brief discussions of the major RI/FS tasks are presented, by major topical categories, in the following sections.

FIGURE 1

REMEDIAL INVESTIGATION



RI/FS WORK PLAN STANDARD TASKS

TASK	TITLE
1	Project Planning
2	Community Relations *
3	Field Investigation
4	Sample Analysis/ Validation
5	Data Evaluation
6	Risk Assessment
7	Treatability Study/ Pilot Testing
8	Remedial Investigation Reports
9	Remedial Alterna- tives Development/ Screening
10	Detailed Analysis of Alternatives

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|----|--------------------------------------|
| 11 | Feasibility Study
(RI/FS) Reports |
| 12 | Post RI/FS Support |
| 13 | Enforcement Support * |
| 14 | Miscellaneous
Support * |

* Tasks that can
occur in any Phase
of the RI/FS

Note: Tasks should be numbered and labelled as indicated
in this Statement of Work for the Albion-Sheridan Site.

Figure 2-4. Relationship of RI/FS Tasks to Phased RI/FS Approach.

The following is a list of the names of the persons who have been
admitted to the membership of the Society since the last meeting.

I.

PLANS AND MANAGEMENT

TASK 1 - PROJECT PLANNING

A. INVESTIGATIVE SUPPORT AND DESCRIPTION OF CURRENT SITUATION

1. Information and Data Gathering

a. Site Mapping

The Respondents will prepare an accurate topographic map of appropriate working scale. A base map of the site with a scale of 1 inch to 100 feet (1" - 100') and 2-foot contour intervals will be prepared from this topographic map. The base map will illustrate the locations of wetland areas, floodplains, water features, drainage patterns, tanks, buildings, utilities, paved areas, easements, right-of-ways, known or suspected sites of environmental contamination that exist in the geographical area and other pertinent features. Larger scale maps will be produced from the base map as necessary.

In addition to the topographic map, a grid plan will be prepared using the base map and grid overlay. This grid plan will show sampling locations and the locations of water supply wells. Existing monitoring wells on-site will be located and indicated on the grid. These maps will require surveying to establish horizontal and vertical controls for sites of the work relative to the National Geodetic Vertical Datum of 1929.

The Respondents will review and verify in the field the legal description of the property. The intent is not to perform a boundary survey, but to locate the boundaries so that future activities do not carry over onto adjacent property without proper permission. Boundary markers will be set in place and maintained.

b. Metes and Bounds

The Respondents will assemble a legal description of the site from existing county and township records and results of the site survey.

c. Access Arrangements

The Respondents will make the necessary arrangements to guarantee access to the site and surrounding parcels. These arrangements will include negotiating access agreements with landowners and obtaining demarcation clearance for all buried utilities and construction of

access roads. "Miss Dig", a Michigan statewide network that locates utilities in or near areas of construction or excavation, will be notified so that they may have the opportunity to mark, in advance, the location of all utilities in the area of the site investigation.

d. Preparation of Support Facilities

The Respondents will initiate and implement the necessary arrangements to construct support facilities and/or procure the equipment necessary to performing a hazardous site investigation. This includes preparation of decontamination facilities, utility hook-ups, and site access control stations.

e. Description of Current Situation

The Respondents will gather and describe the background information pertinent to the site and its environmental concerns, further detailing the purpose of the RI. The data gathered during previous investigations will be reviewed and evaluated. Regional information will be obtained from available USGS and Michigan Geologic Survey reports. The existing site information to be reviewed will include but not necessarily be limited to:

- o Michigan Department of Natural Resources and Environmental Protection Agency files.
- o Calhoun County Soil Conservation Service reports.
- o Calhoun County Health Department files.
- o Aerial photographs.
- o Historical water quality data.
- o U.S. and Michigan Geological Survey files.
- o Disposal records (if available).

In addition to this literature search, on-site activities may be used to confirm and/or update certain information. For example, existing monitoring wells may be inspected to determine if they are functional and the location and status of selected water supply wells field verified.

2. Preliminary Site Evaluation

Information and data that are gathered during these initial steps will be used for a preliminary site evaluation that will

address the following:

- a. A complete history of waste disposal activities and ownership transfer on the site.
- b. A description of pertinent site features and boundary conditions, general site physiography, hydrology, and geology.
- c. A summary of known or potential on-site and off-site health and environmental effects based on existing information. Threats or potential threats to public health and the environment will be emphasized.
- c. The history of response actions that includes a summary of response actions conducted by local, state, or private parties.
- d. A definition of site boundary conditions to identify the areas of investigation. The boundaries will be set so that the on-site activities will cover the contaminated media in sufficient detail to support the FS. Boundaries for site access control and site security will also be identified. The boundaries of the study area may or may not correspond to the property boundaries.
- e. Identification of potential receptors, both human and environmental. For a potentially exposed population, information will be collected on population size and location. Census and other survey data may be used to identify and describe the population potentially exposed, in addition to information from USGS maps, land use plans, zoning maps and regional planning authorities. Also included will be the identification of private and public water supply wells within a two mile radius of the site. If possible, obtain the well construction details for these wells and other private water supply wells that may have been previously sampled and prepare a table summarizing the known construction details to submit with the original drilling logs.
- f. Development of a site conceptual model using information on the waste sources, pathways and receptors at the site. The conceptual site model will include all known and suspected sources of contamination, types of contaminants and affected media, known and potential routes of migrations, and known or potential human and environmental receptors. If data are unavailable for components of the model, the likely variability in the component will be identified so that the model identifies the possible range of contaminant migration and the

potential effects on receptors. The site conceptual model, in addition to assisting in identifying where samples need to be taken, will also assist in identifying appropriate remedial technologies. All subsequent site investigation activities will refine and validate this model.

The preliminary site evaluation will support and be included in the Work Plan.

B. RI/FS WORK PLAN PREPARATION

A RI/FS Work Plan will be prepared for the Albion-Sheridan site that details the technical approach, personnel requirements, and schedule for each task described in this SOW. The schedule will show the implementation of tasks and submission of deliverables. The timeframes will be consistent with the submittal schedule attached to this SOW.

The Work Plan shall be submitted in accordance with the schedule defined in Section VIII (Work to be Performed) of the Consent Order. Specifically, the RI/FS Work Plan shall be developed and implemented in conformance with all provisions of the Consent Order, this SOW, and the standards set forth in the following statutes, regulations, and guidance:

- o CERCLA, as amended by SARA, especially Section 121,
- o U.S. EPA "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA," Interim Final, dated October 1988,
- o The National Contingency Plan, 40 CFR Part 300, as amended,
- o U.S. EPA "CERCLA Compliance with Other Laws Manual," Parts I and II, August 1988 and 1989, and,
- o Any additional guidance documents provided by the U.S. EPA.

Incorporated into this Work Plan will be the following specific plans:

1. Field Sampling Plan

A Sampling Plan that addresses all data acquisition activities will be prepared. The plan will contain a statement of sampling objectives and equipment specifications, required analyses, sample types, and sample locations and frequency. The plans will address specific hydrologic, hydrogeologic, and air transport characterization methods including, but not

limited to, geologic mapping, geophysics, field screening, drilling and well installation, flow determination, and sampling.

In addition, the plan will identify the data requirements of specific remedial technologies that may be necessary to evaluate remedial alternatives in the FS. It will include an evaluation explaining what additional data are required to adequately characterize the site, evaluate the no-action alternative, and support the feasibility study. It will provide a schedule stating when events will take place and when deliverables will be ready.

2. Quality Assurance Project Plan

A Quality Assurance Project Plan (QAPP), prepared in accordance with current U.S. EPA guidance, will be appended to the Sampling Plan. The QAPP will describe the project and project personnel organization and responsibilities. It will include quality assurance objectives for data (precision, accuracy, completeness, representativeness, comparability, and intended use) and specify sampling procedures, locations, parameters, number of samples, and sample custody.

The QAPP will specify the type and frequency of calibration procedures for field and laboratory instruments; the analytical procedures used; the procedures for data reduction, validation and reporting; the type and frequency of internal quality control checks; the type and frequency of quality assurance performance audits and system audits; the preventive maintenance procedures and schedule; specific procedures to assess data precision, representativeness, comparability, accuracy, and completeness of specific measurement parameters, and corrective action procedures for field and laboratory instruments.

The QAPP will also describe how the data will be documented and tracked, including documentation materials and procedures, and financial reporting procedures. A pre-QAPP meeting will be held to review and discuss the details needed in the QAPP.

3. Health and Safety Plan

A Health and Safety Plan to protect the health of personnel involved in site activities and the surrounding community, will be developed on the basis of site conditions and be consistent with the following regulations and guidance:

- o 20 CFR 1910.120 (i) (2) - Occupational Health and Safety Administration: Hazardous Waste Operations and Emergency Response, Interim Rule, December 19, 1986.

- o U.S. EPA Order 1440.2 - Health and Safety Requirements for Employees Engaged in Field Activities.
- o U.S. EPA O 1440.3 - Respiratory Protection.
- o U.S. EPA Occupational Health and Safety Manual.
- o U.S. EPA Interim Standard Operating Procedures (September, 1982).

The health and safety plan will provide information on provisions to protect site visitors, personnel responsibilities, protective equipment, procedures, protocols, decontamination methods, and medical surveillance, routes and maps to local hospitals and phone numbers of emergency personnel.

4. Data Management Plan

A Data Management Plan will be developed to document and track investigative data and results. The plan will identify and establish laboratory and data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents.

5. ATSDR Health Assessment

The Work Plan for the site will also provide for collection of adequate information to support the ATSDR Health Assessment required by SARA. Since the health assessment will be prepared by ATSDR, all draft Work Plans and support documents will be submitted for ATSDR review and comment to ensure that their needs and requirements are being met. In the event that the health assessment has already been completed by ATSDR, the RI report will include and address the findings of that report.

6. Baseline Risk Assessment

The Baseline Risk Assessment, which will include an evaluation of the risks to human health and the risks to the environment, will be performed by U.S. EPA. The Work Plan will provide for collection of adequate information to support this assessment. The Baseline Risk Assessment will be conducted in accordance with U.S. EPA's "Interim Final Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual" (Part A) and U.S. EPA's "Interim Final Risk Assessment Guidance for Superfund, Volume II, Environmental Evaluation Manual," as well as the NCP, the RI/FS Guidance, and any other appropriate guidance and data bases.

II.

REMEDIAL INVESTIGATION

The objectives of the RI are to:

- o Characterize contamination present at the site;
- o Characterize the source(s) of potential contamination;
- o Characterize the hydrogeologic and physical setting, and evaluate the most likely contaminant migration pathways and physical features that could affect potential remedial actions;
- o Determine the migration rates, extent, and characteristics of any contamination that may be present at the site;
- o Gather data and information to the extent necessary and sufficient to quantify the risk to public health and the environment; and
- o Support the development and evaluation of viable remedial alternatives in the FS.

The scope of the Remedial investigation consists of six tasks:

Task 2: Field Investigations

Task 3: Sample Analysis/Validation

Task 4: Data Evaluation

Task 5: Bench/Pilot Testing Studies

Task 6: Reports

Task 7: Community Relations Support

Each of these tasks is described in the following sections.

TASK 2 - FIELD INVESTIGATIONS

Investigations necessary to characterize the site and its actual or potential hazard to public health and the environment will be conducted. The investigations will result in data of adequate technical content to support the development and evaluation of remedial alternatives during the FS. Investigation activities will focus on problem definition and data to support the screening of remedial technologies, alternative development and screening, and detailed evaluation of alternatives.

The field investigation activities will follow the Plans set forth in Task 1. All sample analyses will be conducted at laboratories following EPA protocols or their equivalents. Strict chain of custody procedures will be followed, and all samples will be located on the site map (and grid system) established under Task 1. A description of the types of investigations that will be conducted is presented below.

A. WASTE CHARACTERIZATION

Determine the location, type and quantities as well as the physical or chemical characteristics of any waste remaining at the site. If hazardous substances are held in containment vessels, the integrity of the containment structure and the characteristics of the contents will be determined.

B. HYDROGEOLOGIC INVESTIGATION

Evaluate the subsurface geology and characteristics of the water bearing formations, as well as determine the presence and potential extent of groundwater contamination. Efforts should begin with a survey of previous hydrogeologic studies and other existing data. The survey should address the soil's retention capacity/mechanisms, discharge/recharge areas, regional flow directions and quality, and the likely effects of any alternatives that are developed involving the pumping and disruption of groundwater flow. Results from the sampling program should estimate the horizontal and vertical distribution of contaminants, the contaminants' mobility and predict the long-term disposition of contaminants.

C. SOILS AND SEDIMENTS INVESTIGATION

Determine the vertical and horizontal extent of contamination of surface and subsurface soils and sediments and identify any uncertainties with this analysis. Information on local background levels, degree of hazard, location of samples, techniques used, and methods of analysis should be included. If initial efforts indicate that buried waste may be present, the probable locations and quantities of these subsurface wastes should be identified through the use of appropriate geophysical methods.

Characteristics of the existing landfill cover should also be defined.

D. SURFACE WATER INVESTIGATION

Estimate the extent and fate of any contamination in the nearby surface waters. This effort will include an evaluation of the point of discharge to these surface waters, possible future discharges and the degree of contaminant dilution expected. Drainage patterns and runoff characteristics will also be evaluated for potential erosional transport, and any floodplains will be defined.

E. AIR INVESTIGATION

Investigate the extent of atmospheric contamination from those contaminants found to be present at the site. This effort should assess the potential of the contaminants to enter the atmosphere, local wind patterns, and the anticipated fate of airborne contaminants.

F. ECOLOGICAL INVESTIGATION

Biological and ecological information will be collected for use in the Baseline Risk Assessment. The information will include a general identification of flora and fauna in and around the site (including endangered and threatened species and those consumed by humans or found in human food chains) and identification of critical habitats. It is anticipated that this information will be derived from a combination of existing information and data resulting from the field investigations.

Provisions will be made for conducting additional site investigation activities as necessary. These supplemental investigations are intended to further characterize the sources, pathways, and/or contaminants and to satisfy the specific data requirements of the Baseline Risk Assessment and the applicable remedial actions. The Work Plan and supplemental plans (QAPP, FSP, etc.) will be modified and revised during the RI/FS process to incorporate new information and refined project objectives.

TASK 3 - SAMPLE ANALYSIS/VALIDATION

An analysis of all data collected during this investigation will be made to assure that the quality (e.g., QA/QC procedures have been followed) and quantity of data adequately support the Baseline Risk Assessment and FS. Collected data should be validated at the appropriate field or laboratory QC level to determine whether it is appropriate for its intended use.

TASK 4 - DATA EVALUATION

All site investigation data will be evaluated and presented in an organized and logical manner so that the relationships between site investigation results for each medium are apparent. A summary will be prepared that describes (1) the quantities and concentrations of specific chemicals at the site and the ambient levels surrounding the site; (2) the number, locations, and types of nearby populations and activities; and (3) the potential transport mechanism and the expected fate of the contaminant in the environment. This summary will be submitted to U.S. EPA for use in the Baseline Risk Assessment.

TASK 5 - BENCH/PILOT STUDIES

Bench and pilot scale studies will be performed as necessary to determine the applicability of selected remedial technologies to site specific conditions. These may include treatability and cover studies, aquifer testing, and/or material compatibility testing. As shown on Figure 1, these studies will be conducted in the later stages of the RI after the initial screening of remedial technologies and actions.

TASK 6 - REPORTS

A. PROGRESS REPORTS

Monthly progress reports will be prepared to describe the technical progress of the RI/FS. These reports will be submitted to the U.S. EPA by the tenth business day of each month, following the commencement of the work detailed in the RI/FS Work Plan. The monthly progress reports will include the following information:

- o All sampling and testing results and all other raw data produced during the month pursuant to the implementation of the Consent Order;
- o Copies of all daily field notes taken during the reporting period;
- o A description of activities completed during the past month pursuant to the Consent Order, as well as such actions and plans that are scheduled for the next month pursuant to the Consent Order;
- o A description of difficulties encountered during the reporting period and the actions taken to rectify the problems;
- o Target and actual completion dates for each element of activity, including the project completion; percentage of work completed, and an explanation of any deviation from the schedules provided in the RI/FS Work Plan;

- o Changes in key personnel which have occurred during the reporting period; and
- o Summaries of conferences calls and meetings held during the reporting period between the PRPs and U.S. EPA and/or MDNR, in order to ensure that mutual agreement and understanding has been reached on all issues discussed concerning the project.

B. TECHNICAL MEMORANDA

The results of specific remedial investigation activities will be submitted in draft form to the U.S. EPA and the MDNR throughout the RI process. The specific technical memoranda and their associated schedule of submittal will be identified in the project Work Plan (Task 1). All responses to U.S. EPA and the MDNR comments concerning memorandum issues will be addressed in letters from the Respondent Project Coordinator to the U.S. EPA Remedial Project Manager and will be incorporated in the draft RI report.

C. REMEDIAL INVESTIGATION REPORT

A draft report covering the remedial investigation, the Remedial Investigation Report (RI), will be prepared. The RI report will characterize the site and summarize the data collected and the conclusions drawn from investigative Tasks 2 through 4. The report will be submitted in draft form for review and comment. Upon receipt of comments, a revised report will be prepared and submitted.

TASK 7 - COMMUNITY RELATIONS SUPPORT

A community relations program will be implemented jointly by the U.S. EPA and the MDNR. The responsible parties will cooperate with the U.S. EPA and the MDNR in providing RI/FS information to the public. The responsible parties will, at the request of the U.S. EPA or MDNR, participate in the preparation of information distributed to the public, such as fact sheets, and in public meetings that may be held or sponsored by the U.S. EPA or the MDNR to describe activities at, or concerning, the site, including the findings of the RI/FS.

Community relations support will be consistent with Superfund community relations policy as stated in the "Guidance for Implementing the Superfund Program" and Community Relations in Superfund - A Handbook.

III.

FEASIBILITY STUDY

The purpose of the FS for the Albion-Sheridan site is to develop alternative remedial actions, based upon the results of the RI, that will mitigate impacts to public health and welfare and the environment.

The FS will conform to CERCLA as amended, the NCP as amended, the RI/FS Guidance as amended, and U.S. EPA policy. The FS is comprised of the four tasks:

- Task 8: Remedial Alternatives Development and Screening
- Task 9: Detailed Analysis of Alternatives
- Task 10: Feasibility Study Report
- Task 11: Additional Requirements

The intent and purpose of each of these tasks is outlined in the following sections; the technical approach and schedule is detailed in the RI/FS Work Plan (Task 1).

TASK 8 - REMEDIAL ALTERNATIVES DEVELOPMENT AND SCREENING

This task constitutes the first stage of the FS and is comprised of five interrelated subtasks. The goal is to develop and evaluate remedial alternatives for additional screening and evaluation. The Baseline Risk Assessment results will be considered throughout the evaluation process.

A. SUBTASK 8A - PRELIMINARY REMEDIAL TECHNOLOGIES

A master list of potentially feasible technologies will be developed that includes both on-site and off-site remedies. The master list will be screened according to site conditions, waste characteristics, and technical requirements, in order to eliminate or modify those technologies that may prove extremely difficult to implement, require unreasonable time periods, or rely on insufficiently developed technology. Emerging technologies being evaluated through the U.S. EPA's SITE Program will also be considered if that information is available. The results of this task will be summarized in a Technical Memorandum that will be submitted to the U.S. EPA and the MDNR.

B. SUBTASK 8B - DEVELOPMENT OF ALTERNATIVES

1. Developing Remedial Response Objectives

Develop site-specific objectives based on public health and environmental concerns for the Albion-Sheridan site, the

description of the current situation, information gathered during the RI, Section 300.430(e) of the National Contingency Plan (NCP), U.S. EPA's interim guidance, and the requirements of any other applicable U.S. EPA, Federal, and State environmental standards, guidance and advisories as defined under Section 121 of CERCLA. Preliminary cleanup objectives will be developed under formal consultation with the U.S. EPA and the MDNR.

2. Assembling Alternatives for Remedial Actions

Develop a comprehensive, site-specific approach for Remedial Action by assembling combinations of identified technologies that include the following:

- a. Treatment alternatives for source control that eliminate the need for long-term management (including monitoring).
- b. Alternatives involving treatment as a principal element to reduce the toxicity, mobility, or volume of waste.
- c. An innovative technology(ies) if that technology offers the potential for comparable or superior performance or implementability, fewer or lesser adverse impacts than other available approaches, or lower costs for similar levels of performance than demonstrated treatment technologies.

Develop at least two additional alternatives that include the following:

- c. An alternative that involves containment of waste with little or no treatment but protects human health and the environment primarily by preventing exposure to, or reducing the mobility of, the waste.
- d. A no action alternative.

For groundwater response actions, a limited number of remedial alternatives will be developed that attain site-specific remediation levels within different restoration time periods utilizing one or more different technologies. The targeted remediation level is the risk range of 10^{-4} to 10^{-6} for excess upper bound lifetime cancer risk. If feasible, one alternative that would restore groundwater quality to a 10^{-6} risk for maximum lifetime risk level within five years will be configured.

The remedial action alternatives developed for the Albion-Sheridan site may involve both source control and groundwater response

actions. In these instances, the two elements may be formulated together so that the comprehensive remedial action is effective and the elements complimentary. Because each element has different requirements, each will be detailed separately in the development and analyses of alternatives.

C. SUBTASK 8C - INITIAL SCREENING OF ALTERNATIVES

1. Initial Screening Considerations

The alternatives developed under Subtask 8B will be subjected to an initial screening to narrow the list of potential remedial actions for detailed analyses; the rationale for eliminating alternatives will be included. Initial screening considerations include:

a. Effectiveness

The degree to which the alternative to protects human health and the environment; attains Federal and State ARARs or other applicable criteria, advisories, or guidance; significantly and permanently reduces the toxicity, mobility, or volume of the hazardous constituents and are technically reliable and effective in other respects. Reliability considerations include the potential for failure and the need to replace the remedy.

b. Implementability

The degree to which the alternatives is technically feasible and employs available technologies; the technical and institutional ability to monitor, maintain, and replace the technology over time, and the administrative feasibility of implementing the alternative.

c. Cost

An evaluation of construction and long-term costs to operate and maintain the alternative based on conceptual costing information. At this stage of the FS, cost will be used as a factor when comparing alternatives that provide similar results, but not when comparing treatment and non-treatment alternatives. Cost will, however, be a factor in the final remedial selection process, however as described in Task 9.

2. Intent of Alternatives Screening

The initial screening of alternatives incorporating treatment will be conducted with the intent of preserving the most

promising alternatives as determined by their likely effectiveness and implementability. The screening should result in a range of alternatives remaining for further analyses as described previously in Subtask 8B(2).

Innovative alternative technologies will be carried through the screening if there is a reasonable belief they offer either the potential for better treatment performance or implementability, fewer or less adverse impacts than other available approaches, or lower costs for similar performance than the demonstrated technologies.

The containment and no-action alternatives will be carried through the screening process to the detailed analyses.

D. SUBTASK 8D - REMEDIAL ALTERNATIVES ARRAY DOCUMENT

To obtain ARARs from the MDNR, a detailed description of alternatives (including the extent of remediation, contaminant levels to be addressed, and method of treatment) will be prepared. This document will also include a brief site history and background, a site characterization that indicates the contaminants of concern, migration pathways, receptors, and other pertinent site information. A copy of this Alternatives Array Document will be submitted to the U.S. EPA and the MDNR along with the request for a notification of the standards.

F. SUBTASK 8E - DATA REQUIREMENTS

Data requirements specific to the relevant and applicable technologies will be identified. These requirements will focus on providing data needed for the detailed evaluation and development of a preferred alternative.

TASK 9 - DETAILED ANALYSIS OF ALTERNATIVES

The contractor will conduct a detailed analysis of alternatives which will consist of an individual analysis of each alternative against a set of evaluation criteria and a comparative analysis of all options against the evaluation criteria with respect to one another.

The evaluation criteria are as follows:

Overall Protection of Human Health and the Environment addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

Compliance with ARARs addresses whether or not a remedy will meet all of the applicable or relevant and appropriate requirements of

other Federal and State environmental statutes and/or provide grounds for invoking a waiver.

Long-Term Effectiveness and Permanence refers to the ability or a remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met.

Reduction of Toxicity, Mobility, or Volume Through Treatment is the anticipated performance of the treatment technologies a remedy may employ.

Short-Term Effectiveness addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

Cost includes estimated capital and operation and maintenance costs, and net present worth costs.

State Acceptance (Support Agency) addresses the technical or administrative issues and concerns the support agency may have regarding each alternative.

Community Acceptance addresses the issues and concerns the public may have to each of the alternatives.

The individual analysis should include: (1) a technical description of each alternative that outlines the waste management strategy involved and identifies the key ARARs associated with each alternative; and (2) a discussion that profiles the performance of that alternative with respect to each of the evaluation criteria. A table summarizing the results of this analysis should be prepared. Once the individual analysis is complete, the alternatives will be compared and contrasted to one another with respect to each of the evaluation criteria.

The evaluation of alternatives to select the appropriate remedy will satisfy the statutory mandates established in Section 121 of CERCLA, as well as Sections 300.430(a)(i-iii) and 300.430(e) of the NCP. The selected alternative will represent the best balance across all evaluation criteria.

TASK 10 - FINAL FS REPORT

The FS will be prepared in a draft report and submitted for review and comment. Upon receipt of comments, a revised FS report will be prepared and submitted. Deliverables and technical memorandums prepared previously will be summarized and referenced in order to

limit the size of the report. The report will completely document the FS and the process by which the recommended remedial alternative was selected.

SUBMISSION SCHEDULE

<u>Submission</u>	<u>Due Date</u>
Draft Work Plan	60 days after effective date of this Consent Order
Revised Work Plan	30 days after receipt of U.S. EPA comments
Data Evaluation Summary (Task 4)	90 days after completion of fieldwork
Draft RI Report	150 days after completion of fieldwork
Revised RI Report	30 days after receipt of U.S. EPA comments
Alternatives Array Document	150 days after completion of fieldwork
Draft Feasibility Study	90 days after submittal of draft RI Report
Revised Feasibility Study	30 days after receipt of U.S. EPA comments